AMERICAN VETERINARY REVIEW,

JULY, 1894.

NOTICE.—Please address all communications regarding matter for publication, books for Review, Exchanges, etc., to the Editor, 139 and 141 W. 54th St., New York.

EDITORIAL.

DISHORNING IN CATTLE.—This is another important question amongst those operations of veterinary surgery, which it has been customary to classify among those known as "fashionable" operations. The important part being the action which has been taken in some parts of the country in obtaining legislative action to prevent the performance of the operation.

There are several so-called operations of fashion which in the opinion of many are justifiable in the sense of rendering the domestic animals upon which they are performed more useful, better adapted to its services to mankind or more productive in their respective qualities and again less dangerous to themselves.

It is not our object to consider the propriety or the unjustification of these manipulations, and in fact, practically speaking, our experience on the subject of dishorning is too limited to express an opinion, but we have received a letter from one of our correspondents which no doubt will throw a certain amount of light on the subject of no little advantage.

The letter reads as follows:

DEAR DOCTOR:

I write you to ask whether there be a law against dishorning cattle or not. I have dishorned some two hundred or so, this last season. The first lot, fourteen in number, I was very careful to see if there were any bad results or not. I took the temperature before operating and for two days after, and found at no time the slightest rise. The milk was carefully weighed before and after, they never lost a feed, and at no time indicated in any way pain in their heads. I am very favorably impressed with the operation as it entirely changes their disposition, there is no chasing or goring when let loose in yard, and they herd together like a flock of sheep. I use the

"Keystone Dishorning Clipper," which makes a very quick, clean cut, (cutting from four sides) the wound heals very quickly with but little suppuration. I find quite a percentage of my cases of "Garget" caused from being hooked behind.

I find no one that has had his herd dishorned, that would willingly allow a cow with horns on in his yard again. With good help I can readily take off 75 cows per hour. They thrive better, put on more flesh, and give a larger flow of milk, simply because they are more quiet.

Yours very respectfully,
F. T., D.V.S.

McKILLIP VETERINARY COLLEGE.—We have received from the dean of the above-named institution the following, with request to insert:

The following chairs in the faculty of the McKillip Veterinary College at Chicago have not been filled, and remain open to competition, namely: Physiology, Materia Medica, Surgery, Hygiene, and Meat and Milk Inspection.

Gentlemen who have had experience in teaching these branches, or who consider themselves able to do so, are invited to send their application, which must be accompanied by a curriculum vitæ, written by the applicant, together with the compensation asked. Only such persons who are eligible to membership in the United States Veterinary Medical Association need apply.

Applications must be sent to

OLOF SCHWARZKOPF,
Dean of the Faculty,
No. 1639 Wabash Ave.,
Chicago, Ill.

This means a good step in the organization of the new school, and our friend Dean Schwarzkopf knows how to secure his assistants in the faculty board. Let us hope, however, that he will not be obliged to ignore the recommendations of the paper on "Veterinary Education," and that, on the contrary, he will take advantage of the brilliant opportunity offered him. Already experienced teachers will do; but belief on one's self-ability to teach ought not to be sufficient. The vacant chairs of the McKillip Veterinary College remain open to competition, says the notice, and we feel highly gratified by this action, which will record the new school as being the *first* among medical or veterinary institutions where professorship will mean a great deal more than that of other colleges—more than an appointment through friendship, ambitious desire or, perhaps, "pecuniary bargain."

ORIGINAL ARTICLES.

THE DOSE OF TUBERCULIN.

By George A. Kinnell, M.R.C.V.S., Pittsfield, Mass.

A paper read before the Massachusetts Veterinary Medical Association.

Through the medium of your columns I wish to add my testimony as to the great value of tuberculin as a diagnostic agent in the detection of tuberculosis among the bovine species.

But, as in the matter of dosage, my experience has differed somewhat from that of other observers who have recorded their observations, I take the liberty of going into details.

As far as I can find out, those veterinarians who use tuberculin do so in doses of from one to three drops for a mature cow; the most common dose being from two to three drops.

Now, in my practice I have used, with the most gratifying results, a maximum dose of two-thirds of a minim; for yearling creatures I use one-third of a minim; for mature animals of small size or low condition I use from one-half to two-thirds of a minim.

What have been the results?

By this system I have been enabled to detect the presence of tuberculosis in all its stages from the earliest to the most advanced.

The most marked reaction I have met with, an elevation of 6 2-5 degrees, was got out of a large-sized Jersey cow. The post-mortem examination revealed a few lesions on the surface of the spleen, but so far as microscopic examination could detect the lungs and all the other organs were entirely free from tubercular lesions. Again I have got elevations of 3, 4 and 5 degrees in animals which were afterwards found to have tubercular lesions in the most advanced and aggravated forms.

Others, again, have shown one or two tubercular nodules not larger than a hazelnut.

While I am thoroughly convinced that a large dose has no advantage whatever over a small one, I am, on the contrary, of

the opinion that a small dose, such as I use, is preferable to larger doses, and will give more certain results.

Three weeks ago I had occasion to test a herd which had been tested by another practitioner last February. I understand the dose of tuberculin he used was two drops and a half. A number of the animals gave the reaction indicative of tuberculosis, were condemned by him and, on post-mortem examination, the correctness of his diagnosis was fully verified. There were eleven animals, however, which did not give the reaction, and were passed as sound. These eleven creatures were tested by me three weeks ago with my maximum dose of two-thirds of a minim, and of the eleven animals four gave reactions of from 2 to 4 degrees.

I slaughtered the animals next day, and found them in advanced tuberculosis. In one of them the bronchial lymphatic glands were enormously enlarged, containing large quantities of liquid and caseous pus. The second cow was not so badly affected, but showed extensive lung lesions. The third cow was still less diseased, having in her right lung a caseous tubercular mass as large as my fist, while the fourth cow had at the upper part of her right lung a solitary nodule about the size of a hazelnut. The latter animal, I thought, might have become affected subsequent to the original test.

Can it be that a small dose is more reliable than a large one? or did the the tuberculin first injected aggravate the trouble and in some way render the system more susceptible to a second test.

To sum up my conclusions:

First.—The dose of tuberculin ordinarily used is unnecessarily large.

Second.—A dose of two-thirds of a minim is at least sufficient.

Third.—A small dose may be more certain and more reliable than a large one.

In condemning animals, I followed the usual rule that an elevation of 2 degrees indicates the presence of tuberculosis.

The tuberculin used was that manufactured by Koch and

imported by Schulze, Berge & Koechl of New York. This was diluted with a 1% solution of carbolic acid in distilled water. My prescription for, say nine mature cows, is as follows:

℞ Tuberculin, six minims.
Carbolic solution, eighty-four minims.

Dose of the above, ten minims.

I inject the agent under the skin of the creature's neck. the skin is looser here, thinner and more easily pierced; besides the operator can stand further from the cow's hind foot.

Would it not be as well if observers, in speaking of the quantities they use, express themselves in minims and drachms instead of using measures of the metric system? They would be more readily understood by forty-nine out of every fifty veterinarians, and besides would be after all only using the standard in general use in the country.

FUSION OF TEMPORARY INFERIOR MOLARS WITH INFERIOR MAXILLA IN THE HORSE.

By Prof. W. L. Williams, D.V.S.

In a previous paper* the abnormal adhesion of temporary teeth was suggested as a possible factor in producing aberrations in the development of permanent teeth.

Not long after contributing the article cited, a case presented itself which was quite unique, and although odontomes did not result in so far as aberration in the disposition of dental tissues were concerned, effects of an equally profound character were produced which go far to demonstrate that these abnormally adhesive temporary crowns may and do cause odontomes in some cases.

The patient was a medium sized, well-formed grade French draft gelding but three years. He had been worked for some months in a coal wagon, and when presented for treatment was in poor condition, because of the pathological conditions rather than of excessive labor.

*A Clinical Study of Odontomes.—Am. Vet. Review, Vol. XV., No. 1.

Two spherical tumors presented one on either ramus of inferior maxilla, each about four or five inches in diameter, centering in alveolar cavity, at position of second pre-molar. The tumors were hard, evidently of bone, and were painful to touch. Mastication was imperfect, painful and accompanied by frequent quidding.

Exploration of tooth crowns revealed nothing noteworthy.

The tumors were freely trephined at about their center, and in one of these there was found some pus, containing particles of food.

In both tumors apparently healthy tooth tissue was encountered, which, after clearing away the investing bone so that a clear view could be had, proved to be healthy, naturally-formed molars, disposed almost longitudinally in relation to inferior maxilla, the fang pointing forwards and slightly declined, the crown backwards, slightly ascending.

The viciously-disposed teeth, after comminution with chisel and mallet, were removed, when the temporary crowns were found still undisturbed projecting into the mouth. Water could be thrown through trephine opening into mouth, and to insure recovery the removal of temporary crowns was determined upon, and the tumor cavity, extending up against these, it was presumed that a slight tap on the punch from below would promptly send the persistent crowns into the mouth. In this, however, we were promptly disappointed, and only succeeded in dislodging the crowns after some quite hard hammering.

When the crowns finally came away, and were examined, it was found that the alveolar processes had in part come away with them, there being perfect fusion between crown and alveolus, so intimately blending as to render it impossible, with the naked eye, to say where the one ceased and the other began. The case made a slow but complete recovery.

It seems fair to conclude that adhesions of a much less degree might, by infringing upon the rapidly forming permanent tooth, cause aberrations in its structural growth, and thus lead to the formation of well marked odontomes.

SURGICAL TREATMENT OF THE DISEASES OF THE HOCK JOINT.

By Prof. W. L. Zuill, M.D., D.V.S., Philadelphia, Pa.

A paper read before the Pennslyvania State Veterinary Medical Association.

In presenting this subject for the consideration of this body of veterinarians representing the Profession in Pennsylvania, it will no doubt be in order to offer an apology for having the assurance to bring before you such a threadbare subject. It is not my object to offer you any new theories, but rather a new application of old ones, and the result obtained by a work-a-day veterinarian.

The statistics which I give, have been compiled entirely from my own case book, from the first of January 1890 to the end of December 1893, and embraces only those operations done in private practice, excluding entirely my hospital work for those years. There are also statistics obtained from a few practicing veterinarians, with the results obtained by them, and which contain some very valuable information.

Acute Spavin.—Before entering upon a detailed consideration of our subject, we will first hurriedly review the different forms of lameness in the tibio-tarsal articulation. The first group of lamenesses to which I shall call your attention, are those usually considered under the comprehensive term of *Acute Spavin.* Under this heading we have several distinct, and well defined lesions, all of which either entirely suspend the functions of the joint, or very greatly impair its usefulness. We may divide them into five distinct groups: Traumatisms, Lesions of the Tendinous Structures, Lesions of Synovial Membranes, Lesions of the Periosteum and Ligaments, and Lesions of the Bones. These lesions may exist separately, or two or more groups may coexist in the same articulation. The lameness which results from a Traumatism is unmistakable. It is of an intense character, the function of the limb is entirely suspended, locally there is an intense inflammatory swelling, hot and painful to the touch. In some instances this lesion will make a good recovery under ordinary treatment, but the majority of cases will run into

the sub-acute form, leaving all the structures of the hock thickened, indurated and inflamed, with marked impairment of its function. The bones of the articulation are the seat of an active inflammatory process, which comprises the articular cartilage, and the synovial membrane, making it impossible for the animal to carry weight comfortably upon the injured extremity; and is of itself sufficient cause for lameness. The *periosteum* is thickened and inflamed, sore and sensitive; the ligaments and tendons attached to it functionally agravate the lesion and intensify the lameness. The *Cunean tendon* of the flexor metatarsi is also compromised in this lesion; it is found indurated and vascularized, often to such an extensive degree, that it loses its tendinous character; its white glistening appearance is changed, and a red vascular structure takes its place. Associated with this is an inflammatory transudation, into the tendinous synovial bursa with vascularization of its walls, and hypertrophy of its fringes. Either of these lesions are sufficient to produce an intense lameness with symptoms and history of acute spavin. These traumatic complications of the hock joint can easily be diagnosed, because of the fact that they are always associated with a diffused induration of the entire articulation.

Given a case of hock lameness, however, with symptoms and history of acute spavin without the diffused swelling and induration, and it will always be found to have arisen from other causes than traumatism.

Lesions of the Tendon.—That form of acute spavin due to localized lesion of the *cunean tendon* can always be easily diagnosed from other acute lameness of the hock. The lameness is very intense, the animal stands in the stall with the leg flexed well up to the belly, and it is difficult to make him carry any weight upon it; but after going some distance upon three legs he may lightly touch the toe to the ground. By elevating the front foot on the lame side the animal is compelled to place the lame leg upon the ground in order to maintain his balance, then a digital examination can be made. The abnormal heat of the parts is limited to the region occupied by the tendon, which can

be distinctly outlined owing to an increase in its size, and is extremely sensitive to pressure.

With such clinical symptoms it is not possible to make any other diagnosis than that of sprain of the cunean tendon. We must at the same time bear in mind the fact that this lameness does not improve on exercise, but continues to grow worse with every mile travelled, and with every additional days labor performed; neither does he rest out of his lameness, in any reasonable number of days or weeks.

Lesions of the Synovial.—It goes without saying that those causes which contribute to lesions in the tendinous structures also tend to compromise its synovial sheath; but it is by no means rare to find a synovial complication without an injury to the tendon. When the synovial lesion exists alone, or is but slightly complicated, the diagnosis is easily made. The rational and local symptoms are those of acute synovitis; the swelling on the face of the joint has a puffy, fluctuating character, and extends along the borders of the tendon. This is much more evident when the foot is raised from the ground. The hard, elongated tumor along the course of the tendon, which may have been mistaken for bone spavin, is now soft and fluctuating, which confirms the diagnosis. The lameness in this complication is not so intense as that associated with lesion of the tendon; it varies but slightly under the influence of work or rest, and the animal travels with the articulation more or less flexed and the extremity carried well forward.

Lesions of the Articular Ligaments and Periosteum.—Acute spavin from lesions of this character, are perhaps, the most common, and often give rise to the most serious consequences; especially if treated by a timid surgeon. It is in injuries of this character that common bone spavin has its origin, and we may each ask ourselves these questions: Have I not in many cases contributed to the formation of spavin by the injudicious application of fire and blister? Have I not had many cases of acute lameness of the hock joint grow worse and worse, and the calcareous deposit become greater and greater after each repeated

blister, and after each application of the fire? Have I not treated many cases of hock lameness which were unsatisfactory to the owner and mortifying to myself? I can answer these questions by saying that I have had a number of such experiences. The diagnostic symptom presented by this form of hock disease is that which is familiar to all of us. The animal goes upon his toes and warms out of his lameness after going a certain distance, but which again appears after a short rest, and may be again described as regularly intermittent. This is the only form of spavin lameness on exercise, even in its most acute stage; but prolonged exercise will aggravate the condition.

Lesions of the Bones.—It frequently happens that there are lesions of the cuneiform bones, with consequent absorption of the articular cartilage, and ulceration of those surfaces, the lameness associated with it is entirely different from that which we usually consider belongs to this articulation. It is simply that of an ulcerative arthritis. It is not a very marked lameness, and in many instances hardly sufficient to take the animal off his work. It is very persistent in character, it does not improve on exercise or get worse on work, neither does prolonged rest greatly benefit the condition. The shoe is often worn as well on the lame side as on the sound side; the owner will always think that he has a case of rheumatism, and the veterinarian not infrequently fails to make a diagnosis. When the two lesions exist in the same hock, that is, an interarticular spavin associated with a diffused periostitis, with more or less calcareous deposit; then the lameness is a mixture of the two diametrically opposite groups of symptoms, that I have shown belong to these lesions when they exist alone. Under these circumstances we will probably experience the most difficulty in making a diagnosis. It is only after carefully weighing the history and comparing it with the clinical symptoms of the case, and excluding every other disease that may compromise this articulation, that we are able to reach a direct diagnosis.

Having thus far briefly and hurriedly reviewed the conditions presented by the various forms of acute or sub-acute hock lame-

ness is that produced by a mechanical interference with the function of the tendon, due to the presence of the bone tumor. In this case the animal may not warm entirely out of his lameness, but will improve on exercise. In addition to the bone tumor as a cause of lameness in chronic spavin, we may have an ulceration of the articular surface of the true hock joint, or the tibio-astragaloid articulation. With such a complication the lameness is permanent, persistent and continuous; the lameness is more severe than in what is known as inter-articular spavin, or arthritis of the cuneiform bones. The continuous severe lameness, with marked atrophy of the muscles of the croup, should enable us to make a diagnosis of this probable complication, and permit us to avoid the mortification of failure, which would be the inevitable result of an attempt at treatment.

This hurried and imperfect review of the different varieties of spavin lameness and lesions which cause them, brings us up to a consideration of the causes producing these lesions.

Causes.—In a general way it may be said that any cause capable of producing an inflammation of the bones or other tissues of the hock may be the cause of spavin. These causes may act as forcibly on the articular surface of the bones as on the external or periosteal surface. The pressure sustained by the hock joint increases in proportion to a diminution of its width. When the hock is narrow, thin and clean, the cuneiform bones must sustain more weight to the given surface area than when the hock is full, wide and well developed; from which it is seen that a narrow hock especially predisposes to inter-articular spavin. Certain kinds of work also predispose to this condition; animals used for running, jumping and saddle work generally are more prone to develop this disease, because in galloping the posterior extremity with which he leads carries the entire weight of the horse and rider at a certain period of the pace. Spavins developed under such an influence must be essentially articular, an arthritis always developing before the appearance of a bone tumor.

A narrow hock, by the action of an entirely different mechan-

ism also predisposes to bone spavins. An animal driven at any speed whatever places his foot upon an inequality of the pavement, which gives it an inward or outward inclination, thus tending to throw the body in an opposite direction. Between these two forces there is a tendency to flexion of the hock joint from side to side (an impossible normal movement), which is resisted entirely by the lateral ligaments of the joint, frequently resulting in laceration of the fibres and rupture of their periosteal attachments.

In this case the power is the weight of the body, the point of resistance is the hock. Under such conditions the resistance offered to this force is lessened in proportion as the short arm of the lever is reduced by narrowing the hock. On the other hand, the resistive power increases rapidly and in direct ratio to the increased width of the articular surfaces. The ligamentous structures of the joint are less apt to be injured than the bone to which it is attached; hence it follows that these injuries will result in an inflammation of the bone, the deposit of lime salt, and the formation of an exostosis, which if on the inner side of the joint, is called bone spavin.

These two forms of spavin, the inter-articular and the bone spavin, often exist in the same joint, and may mechanically interfere with the function of the articulation of the astragalus, with the cuboid and scaphoid; or these with the two cuneiforms, or they in turn with the metatarsal bones. Muscular effort of any kind superinduces lesions of the tendon of the flexor metatarsi or its attachment on the small cuneiform and head of the internal rudimentary metatarsal. Its synovial sheath is compromised by the same class of causes.

One very important point to be considered is the *hereditary predisposition* in this group of diseases. When a mare, or horse, with spavin is used for breeding purposes, the progeny will inherit the weakness of its parents; that is to say, hock joints deficient in their development and therefore prone to these diseases. Such animals should never be used for stock purposes. It is my opinion that animals with defective or deficient hocks should not

be considered sound for any purpose, no matter how free they may apparently be from actual disease.

Treatment.—Diseases of the hock joint are no exception to the rule that specifics multiply in proportion as the disease is difficult to cure. How many dozens of patent and proprietary preparations can we not find in the market guaranteed to cure spavin in forty-eight hours? We have used every variety of blistering agent that could be devised, and with how much success? My experience teaches me that there is little value or advantage to be derived from the application of a blister in any form of spavin. In fact in every instance, have I been impressed with the fact that it did harm. If we review every form of acute and sub-acute spavin, bearing in mind the pathological condition with which we must contend, will it be possible for us to find a single indication for blister? All of the conditions present at the time would be greatly aggravated by counter-irritation. The theory of the action of counter-irritation is a very pretty one and a very plausible one, but in practice all those pretty theories fail, and after a few experiences of this kind, if we are not able to recognize cause and effect, we will soon find our pretty little craft in which we set sail from our Alma Mater wallowing in the trough of a very ugly sea.

I have never found blistering agents of any value in the treatment of diseases of the hock. I make this broad statement because in my entire fifteen years' acquaintance with the veterinary profession I have never once seen any good results from its use, but in many instances harm was clearly demonstrated; and my experiences in this respect comes down to 1894.

The use of the actual cautery is a means of treating spavins advised by all writers on this subject, and recommended by all practitioners. The one reason why this treatment is so unanimously recommended by the profession is due to the fact that nearly all of us feel that this is the last resource left to us, and that with it we reach the end of our string. When we have been driven into this last ditch we endeavor to hedge ourselves by giving our client a learned discussion on the physiological

action of firing, and leave the back door open by saying it may be necessary to fire three, four or more times before we remove the lameness; while in our inner conscience, we feel certain that before this stage is reached, the owner of the animal will become tired of the treatment and give the beast away. One of my friends, who I do not hesitate to say is one of the best practitioners in Philadelphia, is honest enough to advise his clients in this way rather than undertake the treatment of spavin. To quote from a letter received from him a few days ago, he says, "I generally try to talk my clients into selling these animals and buying better ones." I will show later on that this advice is not good, because he has had seventy-five per cent. of cures in his practice, and his failures have been in horses over twenty years old.

Firing for spavin lameness, whether in lines or points, superficial or deep, has never in my hands given any good results, and in very many instances has made the animal much worse than he otherwise would have been. Firing a horse for spavin has never brought me a single friend or client, but has caused me to lose many good ones.

All writers on this subject end their discourse on treatment with this advice,—"After the animal has been fired a number of times and does not get well of his lameness, you may then make section of the cunean tendon of the flexer metatarsi." This is the worst possible advice either to give or follow, because no horse has ever been cured by section of the cunean tendon after deep and repeated fire. If the fire has been so light as to cause little or no induration of the tissues, good may follow, but it will entirely depend upon the structural changes brought about by the cautery.

Resection of the Cunean Tendon.—The pernicious results of firing forced upon my notice in many instances, together with an entire absence of anything justifying the operation, induced me to abandon it five or six years ago. Since that time I have treated all my cases of spavin lameness by a re-section of cunean tendon of the flexor metatarsi; This operation has been applied in all forms of hock lameness, except the very acute form and

the results which I have obtained are sufficient, in my opinion, to justify continuation in this line of treatment.

If any other treatment can be shown to be as good, as the worst that can be said of *resection*, I am ready to endorse it. On the other hand, it can be said of *resection*; there are no advantages to be obtained from any other treatment, that does not hold good with *resection*. On the other hand, it can be said that the disadvantages chargeable to this operation will apply with ten times greater force to firing, blistering and other forms of counter-irritation. I do not come before you gentlemen with nothing but empty theories, but to present you with clinical facts based upon statistics obtained from my own case book of private practice, not hospital work, as the cases here when once operated upon are usually lost sight of, and from the practice of a few of my friends who are kind enough to prepare them for me.

The statistics show sixty five (65) operations in my own practice since January 1890, and are as follows;

S. Manuf. Co.,	2	T. Brock,	2
Brown & McM.,	2	A. Shock,	1
N. Gravis,	1	I. Griffin,	1
I. Moore,	2	M. Ferris,	2
W. Levy,	1	I. Sharp,	1 not cured.
Dr. Ely,	1	T. Fenton M.D.,	1
L. Godfrey,	4	A. Thomas,	1 after 3 fires not cured.
M. Einstein,	1	S. M. Water Co.,	1 not cured.
I. Austin,	1	Mr. Mann,	2
T. Skelly,	2 (?)	J. Jamison,	4
Y. Wimig,	2 not cured	Mr. Patrie,	2
Vienna Yeast Co.,	4	Mr. Veger,	2
B. L.,	2	Mr. Drummond,	1
S. & T.,	2	I. & P. B. Brewing Co.,	16
I. Walker,	1 (?)		

This shows a total number of eight not cured, in which I have included three questionable. When arranged on a per cent. basis, it will be seen that eighty-eight per cent (88%) were cured completely, four and a half (4½) improved, and seven and a half (7½) not cured. From communications which I have received from practitioners in Philadelphia and vicinity, I find that they have obtained a percentage of cures in some instances

much better than my own, while some have fallen as low as seventy-five per cent. (75%) of cures. In my own case, the first twelve operations show one hundred per cent. (100%) entirely cured, while the first sixteen (16) only give seventy-five per cent. (75%) successful. This tends to show that we cannot base conclusions upon a small number of operations, and the larger the number of cases the more nearly will be obtained correct results. In addition to those, I have twenty-six operations made by other practitioners, eight by Dr. C. H. Magill, six by Dr. Charles Williams and twelve by Dr. Thos. B. Rogers; out of this number six were not cured, and I consider the patient not cured if he is lame two months after the operation; this gives us a total of ninety-one operations with fifteen per cent. (15%) of failures; this percentage may appear to be large, but much of it is due to experimental operations on old horses over twenty, which should not have been included in statistics of operations done in actual practice. If those experimental operations are excluded, it will bring the total percentage of cures up to what I have obtained in my own practice, that is eighty-eight per cent. (88%).

Operative Procedure—Anatomy. I shall only dwell upon the surgical anatomy of the hock, sufficiently long to call your attention to the most important and essential points. The outlines of this internal face may be said to represent an irregular tetragon, the supero-anterior angle of which is formed by the internal tuberosity of the tibia, the postero-inferior angle formed by the head of the internal rudimentary metatarsal bone. These two points are the land marks which guide us in making our incision which is upon the inferior third of an imaginary line drawn from one to the other. The skin of this region is quite thick and vascular, producing quite a hæmorrhage during the operation, which principally comes from an arteriol in the deeper portions of the cutaneous structures. The next layer of tissue is composed of quite loose connective tissue, immediately beneath which we find a layer of dense fibrous structure which is portion of the tibial fascia. This structure must be cut through in order to expose the tendon and to which it is more or less intimately united.

Aseptic Precautions.—Everything must be done in order to secure a wound as nearly aseptic as possible. The hair should be clipped or shaved from the seat of operation and the skin thoroughly scrubbed with a brush, hot water and soap, and rubbed dry with a clean rubbing cloth, then bathed with a one to one thousand solution of corrosive sublimate, this dried off and a five per cent. carbolic acid solution liberally used and allowed to remain on. Then proceed to prepare instruments for the operation. These consist of a straight and probe pointed tenotome, with an extra bistoury, two fine needles threaded with about half a yard of fine silver wire, or fine hare-lip pins and silk thread, one strong rat toothed forceps, two pressure clamps and a thoroughly clean hypodermic syringe and several small sponges. These should all be wiped over with a small piece of absorbent cotton or sponge soaked in pure carbolic acid, which after a few minutes may be dried off with a clean towel, or better, a piece of aseptic cotton, and the instrument laid in a five per-cent. carbolic acid solution. The animal is secured with a twitch and side line on limb opposite the one to be operated upon, and drawn well forward. About one drachm of a five per cent. cocaine solution is injected over the seat of the incision and well distributed in the connective tissue by rubbing the part with the hand. An incision is then made on the inferior third of the line indicated, about one and a half or two inches in length, the lower part of the incision resting on the head of the rudimentary metatarsal at the level of the tarso-metatarsal articulation. It is of extreme importance to have all cutting instruments in perfect condition, as clearly cut tissues heal much more rapidly than do ragged incisions. After having exposed the tendon, the probe pointed bistoury is carried under it with the cutting edge down, the knife has a perpendicular position, it is then rotated into a vertical position by carrying the probe point of the instrument well forward into the anterior cul-de-sac of the synovial bursa. When in this position the edge of the knife is rotated outward a half turn, which brings it against the tendon in a vertical direction, cutting it from forward backward. The

posterior portion of the tendon is seized with the rat-tooth forceps and draw out of the wound and cut as close to its cuneiform as possible. The wound may now be closed with two or three silver wire sutures or pins, which should be loosened or even removed on the second or third day, especially if there is much swelling. Many of these wounds will heal by first intention, and all of them in from twelve to fifteen days.

Complications.—In my experience these have been entirely wanting, and when I have seen them they have been due to the practice of firing or periosteotomy at the time of operation, or to the infection of the wound by dirty hands or instruments. The induration and thickening at the point of operation, which remains after the wound has healed, should give no concern, as it will gradually disappear, and in three or four months be entirely absorbed.

Conclusions.—My experience has taught me these facts: *First*—that the reaction of the cunean tendon for the different forms of spavin will give a larger percentage of cures than any other treatment. *Second*—that it must be performed at least two months before firing, and should be the first treatment, and not the last, as advised by all writers on this subject. *Third*—that the tendon should be *resected* and as much of it removed as possible, simple section not giving satisfactory results. *Fourth*—that the operation should not be complicated by any additional operation, such as periosteotomy or firing, and special care taken to separate the tendon from any surrounding adhesions or connections, as failure not infrequently results from these errors of commission or omission. *Fifth*—that there is but a slight possibility that any bad results can follow this operation, and if it fails to cure, the chances of success with fire are by no means lessened. *Sixth*—that if fire is first applied the chances of success with tenotomy are very materially reduced. *Seventh*—that failures with cunean tenotomy I believe to be due principally to complication of the tibio tarsal articulation, as post-mortem examination in these cases, when the opportunity occurred, indicated this fact.

ACTINOMYCOSIS.

By Dr. G. F. Starkey, Boon, Iowa.

A paper read before the Iowa State Veterinary Association.

(Concluded).

If located in the connective tissue they develop slowly for a varying length of time, according to the resistance offered, but when this is reduced to the minimum they develop more rapidly and give rise to a tumor, from which they derive the name of lumpy-jaw; for it was long supposed by stockmen that this disease affected only the jaw-bone.

The tumor, which in many cases is firm and dense, may become indurated and remain so for years without change for years; but more frequently they break and discharge a creamy detritus which resembles pus, but lacks the specific micrococci, however, which is always present in pus. After discharging for some time, inflammation and congestion may subside and the opening may heal, leaving only a small cicatrix and slight induration of the skin, and this may be the last of that case of actinomycosis, for spontaneous recovery is not infrequent in this class of cases. More frequently, however, there is a large induration left after the fistula closes, and this induration contains some of the fungus that remains to cause a repetition of the changes just noted, after which a larger and more fibrous tumor results. The repetition may end in a complete cure in an encrusted tumor that remains for an indefinite time without change, or pass rapidly from bad to worse, producing emaciation and death.

When the salivary glands are affected, the process of enlarging and evacuating follows each other at shorter intervals than in the preceding, and according to my observations, spontaneous cure never takes place. The entire gland (and surrounding tissues) are affected, and emaciation ensues, the case terminating as the preceding. In case the lymphatic glands are

the seat of this development, the germs are borne from one to another in rapid succession, leaving a fibrous cord to show the route from one to another of the obliterated glands. How long this might continue and what the result might be is a matter of supposition with me, for I have never seen a case where more than twenty-three of these glands were affected, and that was not of long standing, so responded readily to treatment. When the tongue is the seat of the lesion, the stock owner, as a rule, dos not understand that medical interference is necessary until so late that a greatly enlarged organ, covered with ulcers, is what we usually find. Actinomycosis of the tongue seems to form an apparent exception to the rule that actinomycosis cannot exist in the muscle of the bovine species. A careful examination of the superficial structure of the tongue, however, will reveal the true cause. When this disease affects the pulmonary tissue the ante-mortem examination is not in most cases satisfactory proof; but in all such a post-mortem will readily reveal the nature and extent of the lesion. In cases of pharyngeal actinomycosis, the primary seat of the disease is generally external and affects those parts simply by extension. The seat of the trouble may be, however, of primary origin in the pharynx, for even here, as in the intestinal tract, the membrane may be removed and leave a fit place for actinomycotic development. Age, sex, color, size, or breed seem to have no effect upon these formations. The fact that this disease is communicable by inoculation, and that it affects mankind has raised the question —is the flesh of animals affected with actinomycosis fit for human food? In my opinion this depends entirely upon the effect the germ and tumor has upon the general health of the animal.

I care not how large the tumor, or of how long standing, so long as the general health of the animal remains unimpaired and it continues to thrive and fatten, I believe that all the carcass of such animals except the tumor is free from taint and perfectly wholesome for human consumption as food. In any case I believe there is no danger of communication to man even if the animal is becoming thin and emaciated from the effects of the

growth; but in such cases I think the flesh ought to be rejected on the general principle that any animal affected with a disease that so seriously impairs nutrition or destroys the tissues already formed to such an extent as to produce emaciation ought to be rejected as unfit for human food as long as that condition exists unremedied. Having said so much in regard to the sanitary question as it relates to animals with this germ affecting them, we turn now to the treatment, for here is where the financial consideration commences.

This disease, involving as it does, great loss to the cattle-raisers of this country, has until recently been regarded by the veterinary profession as incurable, and is so regarded to-day by that great array of would-be-veterinarians, and many others who ought to know better.

Treatment of these cases consists of internal administration and external application of medicines, with, in some cases, the free use of the knife.

The internal treatment consists in the daily administration of from ℥ ii to ℥ iii of potassium iodide, until iodism is produced, and then a dose of some laxative to regulate the bowels, together with two or three days rest, when the treatment is again to be repeated with intervals between until the tumor shows signs of diminishing, when the treatment may be gradually decreased, but in most cases must be continued until the tumor has nearly or quite disappeared, for in some cases where an apparent recovery has taken place, a few months later, to my surprise, the tumor again began to develop quite rapidly. Some few cases will be found where the growth does not seem to be affected by potassium iodide in the least, and with such it would be well to discontinue treatment in from four to six weeks if no signs of iodism appear, and the treatment has been increased to ℥ iv daily.

Successful treatment by external application requires that the disease be early detected and that the swollen surface be repeatedly blistered, or subjected to the stimulating effects of such agents as soft soap and turpentine. Treatment by evacu-

ation and the escarotic agents works well in the hands of experts; but in the hands of the uninitiated will not give satisfactory results. Evacuation and the use of antiseptics like carbolic acid, creoline, etc., is not successful except in the very early stages, before the dense connective tissue becomes the seat of numerous centers of fungi that cannot be reached by the antiseptic used. Lastly the complete extirpation by the knife if judiciously done is productive of good results. The indications for this treatment are first that the tumor be superficially located, and secondly that it be not too great in extent.

The after treatment of these cases, consisted, in my practice, of application of pine tar and turpentine. All these cases do not permit of a cure by this method, some though they heal up and show no signs of external tumors during life, but on being slaughtered actinomycotic growth are found.

In some of the cases I have operated on, a tumor has reappeared before or soon after the wound was healed. In these cases I infer that all of the tumor was not removed. In the cases treated internally with potassium iodide, where the tumor has reappeared, I infer that all of the germs were not destroyed and that after the medicine had been eliminated from the system they again began development.

By any of the foregoing methods of treatment failures will sometimes be recorded; but probably in the least number of cases where the knife has been judiciously used. I believe, however, that no cases exist where a combination of the foregoing treatment will not effect a radical cure unless the diseased process is located in the chest or abdominal cavities.

The reason for an uncertainty in regard to these, is that I have had no experience with them, and only internal treatment could reach them if they could be diagnosed to a certainty, which is extremely improbable.

The weather and season of the year has a marked effect upon the treatment of this disease, and the food a still greater one, which seems to be entirely overlooked by Dr. Norgard, Inspector in charge of the Chicago Experiments, and all other inves-

tigators as far as I can ascertain. In taking advantage of all things it is well to conclude that actinomycosis is infectious by inoculation, and the discharges should be prevented from dropping over the fields, yards, and pastures. In many cases it renders the flesh of animals unfit for food, thereby causing thousands of dollars loss to the Western stockmen.

In most cases it can be cured, but at best the treatment is expensive and ought to be cheapened.

The kind of feed and season of the year has a very marked effect on the treatment of this disease.

Lastly, this disease needs further investigation before our knowledge is complete. These investigations should extend over the entire change of seasons and be conducted on the stock farms of the Mississippi valley, in order to be of the most value to the stockmen, for here in the home of both host and hostess, and the conditions under which they both live, differ greatly from those obtained at the Western stock yards of Chicago.

PUNCTURED WOUNDS.

By S. H. Bauman, D.V.S., Dubuque, Iowa.

A paper read before the Iowa State Veterinary Medical Association.

In the limited experience I have had I have noticed that the majority of injuries we are called upon to treat in the country are lacerated wounds, due to too close proximity to barb wire fences, while in our city practice scarcely a day passes that we are not called upon to locate lameness, which the owner invariably locates in the regions of the fetlock, shoulder or hips, but which we usually find to be the result of a punctured wound due to a nail prick.

And we will say right here to the credit of the shoers that we have found very few cases where this was due to improper driving of the nails, but by horses picking up nails in the streets.

I believe every city should have a strict ordinance, well en-

forced, prohibiting the sweepings or ashes being thrown into the streets and alleys. Usually boxes, boards, kegs, etc., are burned, when the ashes loaded with nails as well as the sweepings, are dumped into the alleys. The shipping and receiving doors open into the alleys from the warehouses and stores, and by this means our poor animals are compelled to march bravely on to the spikes and brads made ready to receive them.

These are invariably thrust into the soles of the feet, but in one or two cases I recall the nail penetrated above hoof, in or near the coronary band.

Beside nails we also have punctured wounds from toe calks, splinters in runaways and kicking, and being gored by the horns of cattle. Our greatest danger lies in the complications that may follow, such as tetanus or a great amount of sloughing, causing the animal to shed the hoof. We also find in many cases a flow of synovia from an open joint; bursa or sheath of a tendon due to nail prick or fork tine penetrating the cavity.

Usually in cases of punctured wounds, we have elevation of temperature, breathing accelerated, heart action much increased, appetite impaired and very often wholly lost; and all outward appearances show the animal to be in great pain, while in other cases the animal shows little or no inconvenience from the injury. In some cases of nail prick we have much swelling, which may extend up the whole leg to the body, leg very hot and feverish, while in others there is no swelling at all.

Punctured wounds are the most dangerous of all wounds, and should receive prompt attention. If owners realized this they would be saved much trouble and expense. We find the greatest trouble when the nail is not retained in the foot, or, as is the custom, to extract the nail, then fill the opening with tar or some gummy application, and by this means thoroughly seal up the opening, which should have been enlarged, causing the pus or serum to burrow under the sole and wall, and finally finding a point of exit above the hoof or frog.

The treatment from which we have had the most successful results is first and most important. Make a good large external

opening at the most dependent part, so as to get drainage, and keeping this aperture well open until the granulations fill up the puncture to within one-fourth inch of the external opening before allowing the skin to granulate over the surface. Cleanliness is very essential. A solution of peroxide of hydrogen, or mild solution of carbolic acid, will cause the wound to granulate more rapidly than anything we have tried, and also keeps the wound perfectly clean and healthy. Where we have an open joint or flow of synovia, we never inject anything except a mild solution of peroxide of hydrogen into the orifice, and if on the limbs, we pack with oakum and bandage just tight enough to hold the oakum in place; keep the oakum dampened with a 3% solution of carbolic acid.

We never try to stop the flow of synovia, but allow nature to fill the opening with granulations, no matter how long it takes—it must not be plugged up.

We have never derived any benefit from poulticing in these cases, perhaps from the difficulty of retaining them in position.

For nail pricks, by gently tapping, you can locate the spot where the nail entered. When located, remove shoe, also the nail if still in the foot, and with a hoof-knife follow down and cut right through the sole. I would not advise a small opening, in any case to start, less than an inch; making a funnel-shaped opening with half inch at bottom to allow all pus and serum to escape. Also remove all the sole that has been undermined by pus. Then inject a solution of peroxide of hydrogen, and follow with an injection of 50% carbolic acid solution; full strength can be used without injury. Follow this with a good flaxseed poultice, changing every day, for two or three days, or until parts start healthy granulations. In making an opening we keep on cutting until we get to bottom of wound, and do not care for hæmorrhage. We never have had a case of tetanus where the nail prick was opened up properly, and by injecting hyd. peroxide we are enabled to reach all the small canals and drive out the pus. We have tried poultices of ice, ice and salt, bathing in cold and hot water properly antisepticized,

but have noted no marked results or advantages over the flax-seed poultices. As soon as a horse can bear a reasonable amount of weight on the foot have the shoe reset. I would not recommend any rubber or leather to be put under the shoe in these cases, as sand and dirt pack in so tight that it is impossible to keep it clean, or dress without removing the shoe; but make a compress of oakum, and cut a piece of heavy hoop iron the width of shoe, and, by bending, one can get the ends under the shoe; then, by pounding lightly, it will keep the oakum in place, no matter how fast a horse travels. This can be readily removed and repacked as often as necessary. We keep this oakum pack saturated with a 5% solution of carbolic acid. When we get superfluous granulations they are easily gotten rid of with curved shears, knife, burnt alum, strong acid or actual cautery. We should be very guarded in these cases in the prognosis, as the most simple cases often give the most trouble, while the most unpromising surprise us by the rapidity with which they recover. It is not a very enviable position to be placed in, to order an animal destroyed, and find afterward that some stable-man has nursed your patient and brought him out all right—it is a poor advertisement.

I would briefly refer to a couple of cases in our practice where everything seemed most discouraging, the animals made fine recoveries, it being easier to recall these than some that promised well but did not make such fine recoveries.

The first was a fine sorrel horse, 5 years old, weight about 1250 pounds, which was hooked by a bull in the lower part of the neck near the shoulder. We were called about 9 P. M., and found horse in the pasture in this condition. On examination we found a small opening with saliva flowing out in streams. The horse showed considerable distress, deglutition being almost continuous. After a most careful examination, we dissected the muscles carefully, and made an opening fully six to eight inches in length, until we got down to the œsophagus, where we found that organ badly ruptured—being torn almost entirely off, and in a very ragged manner. We took a great deal of

pains to thoroughly clean the parts, using antiseptics, and with difficulty drew the parts together, using a full curved needle and carbolized catgut, making interrupted sutures. If I remember right, we put in seven stitches in the œsophagus. Then we stitched up the skin, closing the wound completely, and ordered the horse tied so he could not eat or drink till morning.

The following morning we found enough swelling to satisfy us, so we removed a few stitches at the most dependent part to allow drainage, there being no flow of saliva at this time or up to the fourth day. We ordered the horse to be fed on nothing but thin gruel, but on the fourth day the owner took pity on the horse and gave him some hay and oats, and in swallowing this rough food a stitch or two was torn in the œsophagus, allowing the food and saliva to flow, but in a much smaller quantity. We did not try to stop the flow after this, but kept the horse on soft food and gruel. After about fifteen days the flow of saliva ceased and in a reasonable length of time the wound healed up nicely. The horse was put to work, and has suffered no inconvenience since. It is now two years since the accident happened. The horse lost little flesh and had little or no systemic disturbance. The only after treatment used was mild antiseptic lotion and cleanliness.

Another case of puncture that seemed like sure death or total disability, was of a fine horse belonging to a carriage team prized very highly by the owner, when the neck-yoke broke, allowing the tongue to fall, and causing the team to run away. The tongue broke and a splinter penetrated the hind leg, starting in at posterior part of the suffraginis, passing under the perforans tendon and down inside of the hoof, and rested on the sole of the foot. The splinter broke off short and remained in the foot. We cast the horse and had to cut the skin and tissues away before we could get hold of it with forceps, and it was with difficulty removed. It came out in two pieces, having split the whole length. The diameter was fully one-half inch and fully eight inches long. We probed the wound and decided best to open through the sole of the foot, it being

the most dependent part, and by that means we secured the best of drainage. We poulticed the foot every other day, alternating with an antiseptic oakum pack for a week, and carefully syringing out the canal every time we dressed the foot or changed the packing. After a week or ten days we had the shoe reset, and kept the oakum compress as described above, and had the groom renew the packing three times a day. We had considerable sloughing and undermining of the sole, which we removed. In this case we had some trouble with contracting of the hoof, but by careful shoeing, blisters and stimulating liniments, the foot has regained its natural size. In six weeks the horse was driven, and has never shown any lameness, and no blemish or enlargement remains to indicate that there had been an injury. The horse suffered terribly the first few days, refused food and water, but after the pus began to flow freely the appetite resumed.

We have tried slings in these cases, also in other injuries, and must say that they have never given us good satisfaction, and we consider them more of a detriment than a benefit. If the animal is unable to stand we prefer them down, rolling them over twice or three times each day.

Complications are liable to set in at any time, and must be met with proper restoratives as the symptoms demand.

Every case must be treated according to the conditions presented, and we must think and act quickly. By proper treatment in the start we save ourselves much trouble that would follow later on by always remembering that good drainage is first and most important. This, with cleanliness and good surroundings, are the essentials for a speedy and favorable termination.

PRACTICAL USES OF COCAINE.

By J. E. Brown, D.V.S., Oskaloosa, Iowa.

A paper read before the Iowa State Veterinary Medical Association.

In preparing this paper I only had in view a brief report of my own personal experience with this drug. Of course it would

be impossible to enumerate all the cases in which this drug can advantageously be employed, but I believe, after consultation with many practitioners, that it should be brought into much more general use in our profession than it is at present. I think, also, that if we once become accustomed to using it, and learn how to *properly* use it, we will become more and more enthused with the results obtained.

If I should make the statement here that I would rather be deprived of the use, in my practice, of any other one drug than this, some of my brother practitioners might be startled; so I won't say so. But in all candor, I must say I do not know of any other one agent so applicable in such a variety of cases, and none other for which it would be so difficult to find a substitute. By its use we have been able to discard the hobbles, operating table, and other means of physical resistance or confinement, to a great extent, and perform what would otherwise be painful and difficult operations with ease and safety to ourselves and almost total unconsciousness of pain to our patients. And by so operating we gain for ourselves admiration and praise from our patrons for humane as well as scientific practice.

In all operations to the eye—removing foreign objects, stitching up torn lids, or removing warts or tumors from the lids, after the application of cocaine the eye can be manipulated as easily and freely as any other part of the body. In the removal of warts and tumors two to five grains (depending upon the size of the tumor), dissolved in a little water, and injected at different points around the seat of operation with a hypodermic syringe, usually produces complete anæsthesia to the parts. In those cases care must be exercised that the injections are made outside of all abnormal tissue, else there will be so little absorption that the drug will fail to exert its influence. A radius of more than two inches cannot be successfully anæsthized from a single puncture, except where it can be made over a nerve trunk, when all the tissues below the puncture, and receiving its nerve supply from that particular trunk, will be influenced.

I have removed tumors of three pounds weight with no

other means of restraint than the twitch, after using the cocaine as above directed.

In more than twenty cases of trephining I have only found it necessary to cast two of the animals. In these cases I usually inject about 1 to 1½ grains of cocaine in solution, immediately at the point of operation, before cutting the skin. Then, if the operation is for the removal of a tooth, a second application of cocaine should be made after the bone is bored, before the mallet and punch is applied.

In neurotomy, when the animal is not particularly opposed to having one foot strapped up, the operation can really be more easily performed with the subject standing than cast. A strap attached just above the fetlock and drawn up over the withers, supports the leg and leaves the foot hanging downward, leaving the seat of operation in a convenient position. Then, with the cocaine injected just above the point for operating, well down into the nerve, any animal that will stand quietly with one foot strapped up can be operated on in this way.

Firing of spavins and ringbones is thus rendered safe and easy. A very small quantity of cocaine injected immediately over the exostosis in spavin may be followed by deep cautery with no evidence of pain whatever.

Another operation which we are called upon to do is the grafting of *split ears*. This would be quite a troublesome piece of work if we could not fall back on cocaine for assistance. After injecting about 1 grain in aqueous solution at the base of the slit, on both the inner and outer sides of the cartilage, the divided edges may be scarified and sutured together without any assistance from the patient. Docking and tenotomy may also thus be rendered painless.

During the past year I have been experimenting with cocaine in castration. In these cases, with the exception of two or three, I failed to get complete anæsthesia, but in all its effect was decidedly noticeable.

After the injection of 3 to 4 grains into each side of the scrotum, the incision may be made without any evidence of pain,

but in severing the cord with the écraseur some degree of pain would be manifested. Injecting directly into the testicle produced very little effect, if any, either on the scrotal walls or the cord. In two or three cases, where I could get at the parts, I made two injections—one in the scrotum and the other into the cord (with quite a long needle), just at or a little above the point of excision, and anæsthesia was complete all through the operation. This last method, however, cannot be made generally practical as the cord cannot be reached for the injection sufficiently high up. Several dogs were castrated, and anæsthesia was complete simply from the injection into the scrotum, and I am fully convinced that this is a practical procedure in all cases of castration. By it I had very little trouble in castrating aged horses without casting, or any other means of restraint than the twitch.

As a test in lameness, cocaine has not acted very satisfactorily for me. In a few cases it has done well, but in many more I have been left in doubt after its use as much as before.

I have been frequently called to cocaine joints, tendons, feet, etc., for a race, and in many instances the results have been very satisfactory, but in other cases it has taken such a quantity to obtain the desired results, and being absorbed, has produced a general narcotic effect, making the animal unsteady in its work. To get the best results, the drug should be administered while the animal is quiet and free from excitement. This feature in the administration demands special attention, for good results are not apt to be obtained if the patient is under excitement when the agent is applied. In this way a small quantity will have its local influence without producing *general effects*.

I have only seen one case in which the drug was used for a surgical operation that any general symptoms followed. In that one several injections were made around a large tumor—probably 10 to 20 grains were used—and after twenty to thirty minutes the breathing became somewhat quickened and shallow, with general nervousness and staring appearance of the eye,

which remained for about an hour. The circulation remained unaltered. Owing to the idiosyncrasies of different animals, more intensified action will be noticed in one case than another from the same size dose; also after a particularly large dose some transient irregularities might be anticipated. I have experienced considerable trouble from time to time in getting a good article of the drug, but where I have had a uniformly good article of the drug I have usually secured uniformly good results.

I have generally found the crystals of cocaine to be of more certain and uniform strength than the powder, and a good article, in my experience, is of a rather clear or opaque color, more like hydrate of chlor., only the crystals are much smaller.

I have not had much to do with the aqueous solutions kept in stock by the druggists, but prefer getting the crystals, which dissolve readily in a little water, and mix fresh for each using.

Some operators have condemned the use of cocaine hypodermically, claiming to have encountered troublesome swellings, ulcers, etc., from its poisonous effects, but with all deference to the surgical knowledge of such operators, I would say, if the drug is pure, made up fresh, and the instrument thoroughly antiseptic, they will encounter no further trouble of that kind.

PSEUDO RABIES IN CATTLE.

By G. A. Johnson, D.V.S., Sioux City, Iowa.

A paper read before the Iowa Veterinary Medical Association.

Gentlemen:—When your secretary requested me to prepare a paper for your consideration at this meeting, the question arose, what should I take for a subject? After considering the matter for some time I resolved to give you, as brief as consistency will allow, the results of my investigations of a disease that was quite prevalent among cattle, in certain sections of the state during the summer of 1891 and spring of 1892.

I present this subject not so much with the view of telling what it is, as to show what it is not. But as several of the veterinarians of the state have had more or less experience with the

disease I trust that I may be able to provoke a discussion that may throw more or less light on the subject.

This disease as seen in cattle, very closely resembles rabies, and I doubt not has often been diagnosed as rabies, and for the want of a better term I will designate it as Pseudo Rabies, as a different affection has been termed Cerebro Spinal Meningitis.

So far as I am aware this affection has never been described in the English language.

HISTORY.—During the summer of 1891 and spring of 1892 a disease, supposed to be rabies was prevalent throughout the north central part of the state. In the official capacity of Assistant State Veterinarian I visited several of these outbreaks. I will not burden you with names of owners and number of affected cattle, etc., suffice to say that I have all of them. In the majority of the outbreaks it was supposed that a rabid dog was the cause of the outbreak, and the owner and his neighbors usually believed that it was genuine rabies. Yet in several cases, I found that the better posted element of the community looked upon it as a new disease, or at least new to them; while in other outbreaks there was no account of a dog having been the cause, yet the symptoms of gross pathology was the same in the various outbreaks.

SYMTOMATOLOGY.—In giving the symptoms you must bear in mind the fact that it is mostly made up from the observation of the parties associated with the animals, while I have seen the disease in all of its various stages, I have never had an opportunity of seeing the disease run its course in same animal, for as officials we are supposed to diagnose a disease and prescribe such regulations as are deemed necessary to control the spread of the disease and in case it be of a contagious nature and then return home. At least we would not be supposed to receive per diem for the time we were waiting to see the disease run its course. But from my observations and the history of the various outbreaks I feel that I can give the symptoms of a fairly typical case.

The first symptoms noticed are bellowing in a peculiar harsh

tone, loss of appetite, accompanied by a startled staring appearance, soon followed by a mild frenzied state, in which an affected animal, that formerly had been perfectly gentle, would be greatly alarmed at the approach of a person and would wildly run away, but as the disease progressed, which was rapidly, this timidity was lost and the animal would become aggressive and chase other animals of the drove and later it would attack any animal or person, and especially a dog or hog, and during the most aggressive stage would attack moving objects, from the size of a mouse up. At this stage of the disease paralysis began to supervene and then there would be alternate periods of frenzy and partial coma. The frenzied periods growing shorter in duration and less in severity, while the periods of coma correspondingly increased in duration and profoundness until complete paralysis supervened. During the early stages of the disease the bowels move quite freely but during the latter stage there is usually a slight constipation. The fæces are nearly if not always of a dark color. During the early stages of the disease small quantities of highly colored urine are very frequently passed.

The pupils of the eyes are usually fully dilated. Prognosis: death; so far as I have been able to learn the disease always terminates in death.

Necropsy, revealed a normal condition of all the internal viscera, except that in a few cases the kidneys were slightly congested and in about 5% of the cases the abomasum was impacted, but in no case was there any marked engorgement. But upon opening the cranial cavity and spinal column, we found marked lesions of inflammation, especially in the brain when all the membranes, especially the pia mater, showed marked inflamed areas and the cavities contained more or less inflammatory exudates, while those of the spinal column contained more or less fluid and the membranes were more or less inflamed, especially in the lumbar region. That portion of the pia mater covering the anterior-inferior portion of the cerebrum besides showing the most marked congestion, was of a dark color. I

will not try to account for the cause of this peculiar dark coloring, but trust that it will be explained during the discussion which I hope that I may be able to provoke.

The arachnoid space was filled with a serous like exudate and the ventricles of the brain were always filled with an inflammatory exudate containing more or less blood, and fibrous clots. I have no data relative to the histological condition of the brain or spinal cord.

Another peculiar feature of the disease is that there is very little bloating after the animal has died. The disease runs its course in from one to ten days, usual length from four to five.

Were these outbreaks of rabies? I emphatically answer no, and I base my opinion on the following facts:

1st. The Pathology, for in this disease we find marked inflammatory changes, and the dark coloring of the membranes, while in rabies we find that the inflammatory changes are very slight, or entirely absent.

2d. The Symptomatology is different in this disease. We find that the excitable stage resembles frenzy more than fits or convulsions as in rabies, and that this stage is of shorter duration and the paralytic stage of longer duration than the corresponding stages of rabies, and there is very little slobbering in this disease, while in rabies it is usually very profuse.

3d. That this disease was confined to localities having similar conditions as to feed and water, factors which certainly do not enter into the localization and distribution of rabies.

During 1891 this disease, so far as I have been able to ascertain, was confined to the north central part of the state, with perhaps an isolated case in other portions of the state, as one case that was brought to my knowledge in the western part of Plymouth county on the Big Sioux River Bottom where the cattle drank from a pond. That portion of the state where the disease appeared as an enzootic, is mostly level or rolling prairie dotted with small lakes and ponds. In every outbreak that I visited the cattle derived their water supply from these ponds, with one exception, and in this outbreak the cattle drank from a

small pond fed by a spring or seap. This outbreak occured in Marshall county, and I will refer to it again. I will try to show that the peculiar conditions of the feed found in this section of the state were associated with, if they were not the cause of the disease.

The early spring of this year was quite wet and these ponds were all filled with water, then there was a month or two of weather, during which a rank growth of vegetation sprang up in the beds of these ponds, then in June we had some heavy rains which filled the ponds thus submerging this vegetation that had grown in the ponds and it soon began to decay, and as the pastures were getting short the cattle fed near to and in these ponds thus eating more or less of the decayed grass, and about this time this disease began to appear, often several outbreaks, situated considerable distance apart, would occur about the same time.

In the Marshall county outbreak before mentioned, the cattle drank from a pool probably about twenty feet wide, and forty feet long, fed by springs further up the swale. But the bottom and banks of this pool were covered by a submerged and decaying vegetation very similar to that found in the larger ponds.

Another fact worthy of notice in connection with this outbreak is, that on this farm there were two herds of cattle, one of about twenty head, composed of young cattle, dry milk cows and one bull was kept in the pasture on the hills and drank from the pool before described. This herd was attacked with this disease and the bull and two heifers died, while the other herd composed of about ten cows in milk, were kept in the bottom pasture and separated from the other herd by a barb wire fence. The cattle in this pasture drank from a small creek that ran through the pasture. None of the second herd were affected with the disease.

In the outbreaks that occurred during the spring of 1892, the general conditions were somewhat different, but the conditions of the feed were similar. The spring was an exceedingly wet one

and most of the forage was badly decayed, and consequently in a somewhat similar condition to that found in the ponds the year before.

Just what is the exciting cause of this affection I am unable to say, but I firmly believe that it is either a germ or fungus, associated with the decayed vegetation that, when taken into the system multiplies and grows and produces the pathological changes and their accompanying train of symptoms. If these were all outbreaks of rabies why should sections, where these conditions did exist, be affected while an adjoining section where other conditions prevailed be exempt from the disease?

Again several children were bitten by the dogs supposed to have been rabid and the cause of these outbreaks, but none of the children even developed any symptoms of rabies, and could we not reasonably expect that if a dog that had rabies in such an aggravated form that he would communicate the disease to ten or twelve head of cattle without even biting one of them, severe enough to leave a visible mark, could bite a child on the hand so that the blood was drawn, that the child would be likely to contract the disease. Such was the history of one outbreak.

Again if these were outbreaks of rabies, why was the disease so much more prevalent in cattle than in dogs, as there was seldom more than one or two dogs affected in a neighborhood. Of animals other than cattle being affected were the dogs, none of which presented symptoms clearly indicating rabies, and in one outbreak one hog was supposed to be affected as were the cattle, presenting similar symptoms, and at one other outbreak a colt. I did not see either of the cases and from the history of the cases was unable to associate them with the affection of the cattle.

Although not going as deeply into the pathology or symptomatology of the disease as I might have wished to have done, I sincerely hope that I have succeeded in presenting the subject in such a light as to elicit a spirited discussion. If such should be the results then the mission of the paper will have been ful-

filled. I will leave the description of the germ or fungi and minute pathology to either the officials of experiment station at Ames or to those of the Bureau of Animal Industry, each of which have been supplied with pathological specimens.

A DISCUSSION OF THE REPORT ON VETERINARY EDUCATION.

By Prof. Olof Schwarzkopf, V.M.D., Chicago, Ill.

Of the many valuable reports presented to our National Association at its last meeting in Chicago none are more important or interesting than the report on veterinary education by Prof. Liautard and that on intelligence and education by Prof. Osgood. These reports constitute a thorough analysis of the good and bad features of our present educational systems, and the suggestions for advancement breathe that refreshing air of professional enthusiasm which must, by necessity, inspire the intelligent part of our profession. Already some of our state societies have been vividly discussing the subject, and it appears that there are not a few who entertain fears for the immediate future of the profession or who even prophesy a temporary degradation.

Personally, I am inclined to look upon this question philosophically. For one acquainted with the history of our profession the condition of affairs offers nothing really alarming. It is true that there exists at present in certain sections of this country a dislocation of professional interests resulting from a natural animosity between the graduates of the good and the bad colleges. But while such conditions are deplorable they seem necessary; an amalgamation of these two elements is unlikely, and a struggle for supremacy must ensue. The same strife has passed long ago in those European countries where veterinary science has raised itself to the level of the learned professions. There it took from twenty to fifty years to bring the matter to a focus and gain a higher professional standard.

The rapidity of the American spirit has cast upon us the same problems within a few years, and there can be no longer any doubt that we are fast approaching a crisis. Whatever will be its outcome, it will largely depend upon the wisdom and conservatism of our leading professional men.

Prof. Liautard suggests in his report that we now have two classes of colleges: Individual or corporation schools, which are supported by the fees of students, and schools which are connected with universities and supported by the state. While such classification is correct in one sense, morally our colleges group together differently. There are the three-year colleges, most of which are now fairly good veterinary schools, and a few of them even stand comparison with some of the old institutions abroad. By right of nature, these three-year schools form one class, and the graduates of these schools represent the scientific veterinarians of America. The two-year schools naturally form the second and lower class, and are of very different make-up. One or two of the old two-term schools have done good work in years gone by and actually fulfilled a mission: they have sent out a sort of rough-and-tumble practitioner, but a man with a ready practical judgment and eminently fitted for the peculiar needs of this country in times past. Some of these men, by their perseverence, honest principles and constant self-education have met with wonderful success; but the bulk of them never overstepped the limits of a humble horse-doctor, and resemble the graduated farrier of Europe of olden times.

Quite different are the younger two-term schools; they are money-making diploma-mills, a distinctly American species. With a few exceptions, the offspring of these schools resemble the clown-like charlatan of mediæval times, as pictured to us in historical novels. They are talkative, self-praising, overbearing and ill-bred men; of course they are uneducated and unprincipled. They noisily spread their diploma all over creation, publicly explain their lengthy degree, and announce that their school teaches new methods of treatment. They

crowd in everywhere; associate with the ward politician, and succeed in winning the few positions offered by the city or state. They even make a run at universities and agricultural colleges and experiment stations to obtain scientific positions, and, strange to say, a few such men have succeeded. If everything else fails, they found a new two-term veterinary college and become professors.

Such are the men who are rapidly filling our ranks. The West especially is blessed with them in abundance. The old quack without the diploma, ignorant but honest, is disappearing, and the modern quack with the diploma, but dishonest and a fraud, is filling its place. If a danger threatens our profession it is from this new enemy alone. Our wrath should be aroused and our energies should be concentrated in stopping these schools from committing further crimes upon the animal world, our growing profession and American civilization.*

(To be Continued.)

PYO-SEPTHAMIE IN FOALS CAUSED BY PHLEBITIS UMBILICALIS.

By John Wende, V.S.

A paper presented at the New York State Veterinary Medical Society.†

The above appellation is used by Prof. Deickerhoff to designate the disease to which I wish to call your attention. Prof. Walley has given the term specific arthritis, or synovitis; Prof. Williams describes the malady under the head of scrofulous ostitis, and considers it as scrofulous in its nature. Some writers view it as a constitutional disease, while others, especially the German veterinarians of to-day, accept it as pyæmic or septicæmic in origin, and a sequel to or identical with omphalo phlebitis. The disease has received attention from some

* The continuation of this article has unfortunately reached us too late to be inserted in this issue.—Edit.

† This did not reach our office until late in March—hence its late publication.

of the leading veterinarians in Europe for the last one hundred years. Brugnone, of Turin, mentioned it as early as 1781. Dietrichs describes the malady in the *Gestutskunde* in 1824 under the name of Lahure multiple anthritis, a disease of foals affecting the bones and joints, and about the same time Wirth designated the disease as acute epilepsy, and Hofacker confounded it with rachitis; Renard, a French veterinarian, reported the disease in 1828 existing as an enzootic at the large breeding establishments of France. In 1831 Strauss described the disease as a constitutional disturbance of the lymphatic system, especially the mesenteric glands. Trager, in 1839, described it as due to a malcondition of the blood. Then followed Heusinger, Funke, Spinola and Vieth, who were converts to the scrofulous hypothesis. Haubner in 1840, being governed by its varied manifestations, described it as three different diseases affecting the suckling young, *viz.*, lahure, rheumatism and arthritis. The views of Hering, in 1749, were that the malady was of constitutional origin, the nature of which hovered somewhere between rheumatism, tetanus and arthritis. This was followed by the theory of Furstenberg as a fatty degeneration of the muscles, the cause of which he cast upon the sheet-anchor catching cold. Then came Roloff with rachitis as the cause of the trouble. Thus the hypothetical confusion of this disease existed until 1873, when Bollinger, by holding repeated autopsies, discovered the true cause of this malady.

As you will infer from the term omphalo phlebitis, we have primarly an inflammation of the umbilicus and umbilical blood-vessels, which forms a distributing point and fountain-head for a metastatic pyæmia; the condition of the navel at or immediately after birth offers every opportunity for the absorption of a septic poison into the umbilical vein, there to regenerate itself a thousand-fold in the thrombus remaining after the cessation of the fœtal circulation; from here the virus, in the form of small emboli, passes through the venal portal into the circulation, by which they are distributed to all parts of the body, lodging in the minute capillaries of any organ or tissue, manifesting its

seat in due course of time by inflammation and suppuration, and, according to the location of the embolism, you may have a varied number of complications, such as pneumonia, hepatitis, nephritis, cerebro-spinal meningitis, arthritis, choroiditis, iritis, etc.

The symptoms vary according to localization and extent of complications; primarily you have hurried breathing, high fever, varying from 100° to 106° F., utter want of appetite, distressed expression of countenance, patient usually preferring the recumbent position, manifesting great weakness if forced to rise; there may appear suddenly an intensely painful swelling of one or more joints, attributed generally to an injury incurred by the mare; these in turn may disappear as quickly as they developed, only to arise again at some other articulation with renewed virulence, usually terminating in suppuration; moist and swollen condition of the navel, from the center of which there may be a discharge of ichorous pus, and immediately connected with this may be a pervious urachus, which is not, however, an inperative condition, and if present is readily recognized by the almost constant dribbling of urine from the umbilicus, which, during the first stages of the disease, is secreted in large quantities, light in color and acid in reaction; constipation of the bowels, which may soon be followed by diarrhœa, the fæcal matter being clay-colored and emitting an extremely offensive stench; fainting spells have been observed as the disease advances, abscesses appear in various parts of the body, and if not opened surgically, will burst, allowing the escape of a creamy and offensive smelling pus, the discharge being especially fœtid if joints and ligaments are affected.

Post-mortem examinations of colts that have died of this malady, disclose many lesions, such as dilatation of the umbilical vein containing a thrombus surrounded by an accumulation of discolored or greyish-white purulent matter, deep-seated muscular and superficial abscesses; liver is enlarged, friable and clay-colored, with localized accumulations of pus, inflammation of the lungs, with abscesses in their parenchyma; the latter may

open into the bronchial tubes, thereby producing a diffuse purulent bronchitis; pleuritis, with serous exudate in thoracic cavity; the heart, spleen and kidneys present structural changes, inflammation of the bowels extending to the mesenteric glands; arthritis with purulent infiltration, often to such an extent that bones, cartilages, ligaments and periosteum have become macerated.

If the veterinarian is called in during the first stages, when the disease has not extended beyond the navel and navel vein, then a favorable prognosis can be given as the omphalitis is only local and amenable to treatment; if, on the other hand, he is not consulted until a generalized metastatic pyæmia has been established, then the prognosis must be guarded.

Siedamgrotzky places the death-rate at 75% Hering cites a record kept of a breeding establishment in Germany for fifteen years, and says that of 187 colts that died there during that interval, 85 succumbed to this malady, and of 67 colts attacked by the disease, 47 died before reaching the age of three weeks.

In order to prevent the trouble the mare should be placed in a stall before foaling where the surroundings are in a perfect hygienic condition, and not into a stall that has been used for the purpose recently, unless it has been thoroughly cleaned and disinfected. If the season of the year and other conditions are favorable, a cleaned pasture field is preferred; if the colt is foaled in pasture, let it alone by all means, unless there are indications of disease; if born in stable, have the latter kept clean, wash the navel several times daily with some antiseptic lotion, or dust the parts with equal portions of iodoform and boracic acid, over which apply a pledget of absorbent cotton, to be kept in place by a bandage around the body. This should be carefully attended to until all danger of infection at the umbilicus is past; ligating the latter, as recommended by some authors, should not be practiced under any circumstances. Some German authors advise an application of pine tar to the navel at or soon after birth.

If the disease is once established, treatment cannot be recommended too soon; if in the first stages, the patient should be laid on its back and held by attendants. The umbilical region should be thoroughly washed with some antiseptic solution, then grasp the navel with one hand, with a sharp scalpel in the other make an incision long and deep enough to find the affected vein, which then should be thoroughly washed out with a 10% solution of creolin, using for the operation a medium-sized human catheter connected to a rubber bulb syringe. Do this several times daily, dust the parts with an equal mixture of iodoform and boracic acid, over which apply a pledget of absorbent cotton, to be kept in place by a bandage around the body. If abscesses have formed they should be opened at once, unless located in the joints, then should be aspirated and the cavity washed out with a saturated solution of boric acid; other abscesses to receive the same attention as umbilicus. Internal remedies should be such as to counteract the conditions present in the case if constipation manifests itself. In summer give small doses of Epsom salts; in cold weather, sweet oil in doses from one to two ounces is preferable, until the bowels regain their normal condition; if diarrhœa exists, this should be overcome with vegetable tonics and astringents; in extreme cases, bismuth subnitras may be given in ten to twenty grain doses two or three times daily. If the circulation is weak and requires stimulation, give spts. camphor one to two drachms, diluted in milk; salicylate of soda and quinine can also be given in their respective doses, but experience has taught me to give the colt as few internal remedies as possible, and at the same time to feed the dam a generous diet in which is mixed large doses of hyposulphite of soda and powdered gentian root.

If pervious urachus exists, inject the ordinary white lotion, or a solution of nitrate of silver, five grains to the ounce of water, several times daily.

CASTRATION.

By W. E. B. Miller, D.V.S.

A paper read before the Pennsylvania State Veterinary Medical Association.

(Concluded.)

One of the ridglings was badly ruptured and I will later on refer to him. Hence the ratio of mortality has been close to 1 2-5 % of this number. Twenty-one were ruptured on one or both sides, twenty-four were operated on for scirrhous cords, following some other man's work on operation. In most cases the hernias were either known of or diagnosed before the operation, but in some not so, and not until it was revealed by the protrusion of the intestine through the opening in the scrotum.

In every case wherein the rupture was known or diagnosed, and in all operations for the scirrhous cord, the animal was cast, as in the operations on ridglings. The record of deaths occurring during this period, is as follows: Asher Applegate, of Smithville, N. J., owned bay stallion three years old, castrated June 15, 1883; he insisted upon having *the animal cast*, which was done when the operation was completed, and the animal let up, he at once became very restless and immediately broke out in a profuse perspiration and seemed much depressed. I could see no immediate cause, so I left him and went to a neighboring farm and operated on a three-weeks-old colt. Before I was through the son of the owner of the other horse came running over and said his patient was bleeding from both wounds and was very weak. I hastened back to the place and was just in time to see the animal fall down, when in a few minutes he died. I at once made a post-mortem examination, and on opening the abdominal cavity, was surprised to find it almost entirely filled with blood; on investigating the cause I discovered a large tumor in the lumbar region, involving and pressing down the posterior aorta to a considerable extent. Just behind the tumor was a large longitudinal rupture of the walls of the blood-vessel, through which all the blood had es-

caped into the abdominal cavity, and had even passed down through the inguinal canals and out of the openings I had made in the scrotum, the horse had bled to death.

Meredith Owen, of Paulsboro, N. J., gray three years old, cut April 23, 1885; took cold on contracted adenitis, and died of it, or from the complication of the two. On May 6th, thirteen days later, Wm. D. Gill, of the same place, had bay colt two years old operated upon on the same day, April 23d, and he died May 14th, with same complications twenty-one days after being operated on.

Geo. Marsden, 1621 South Seventh Street, Philadelphia, owned three-year-old sorrel; I castrated him April 27th, the same year, and he died of lock-jaw May 24th, twenty-seven days after operation. E. C. Cooper, near Newbold, Gloucester County, N. J., had bay double ridgling cut April 12, 1886, died of blood-poison June 30th. The last few days before death he resembled an animal in the last stages of purpura hæmorrhagica.

Summary: Adenitis 2, tetanus 1, blood-poison 1, total of 4. Wm. Smelley, of Dunellen, N. J., stable along the river, in a low marshy land, had two colts cut May 12, 1886. One aged two years, died of lock-jaw May 23d, or eleven days after operation, the other one-year-old having same symptoms, came near dying also, but finally recovered. Amos H. Stratton, Glendale, Camden County, N. J., had a bay four-year-old cut June 3, 1886, was ruptured on the left side; intestines came out and caused much difficulty in replacement; he died of peritonitis June 7th, four days after. James Dalton, near Suffolk Park, Pa.. had bay two-year-old cut July 6th; ruptured on both sides; died of peritonitis July 12th, six days after. Summary: Tetanus 1, rupture and peritonitis 2, 1887; none died. Jacob C. Daubman, Mount Ephraim, Camden County, N. J.. black stallion five years old; very plethoric and skin in bad condition; horse very bad tempered and could not be cared for properly; cut on May 16, 1888; he died June 5th; post-mortem developed double pneumonia. The stables at this farm were in a terribly dilapidated condition, and the weather very bad. The owner also

lost several cows about the same time from causes unknown, so said the attendant. The same owner had bay colt one-year-old, cut on same day, June 2, 1888, and he died on June 6th, four days later; post-mortem showed lesions same as in the black colt, and both presented the same symptoms during illness. In making the post-mortem examinations on these animals, I was assisted by Dr. A. T. Sellers, of Camden, who entirely agreed with me in that death was due and caused by pneumonia. J. B. Justice, of Swedesboro, N. J., had a black three-year-old, cut June 20, 1888; he was ruptured on both sides and very difficult to reduce and replace; it took about four hours to reduce this hernia, and he died June 23d, three days later, showing summary of loss: blood-poison 1, pneumonia 2, peritonitis 1, a total of 4. Joshua Joyce, Woodbury, N. J., double ridgling three years old (poor and weak), cut May 18, 1889; this colt had been cut into on both sides by some one who failed to get either testicle, this rendered the operation more difficult. (Probably this was one of those on which Dr. Rogers failed, it being quite near his place of residence;) Cause of death, lock-jaw. Wm. J. Thompson, of Gloucester City, a Shetland pony two years old, cut April 8, 1890; died of lock-jaw April 18th, or ten days later. S. Burris Richardson, of Massey, Md., had five cut on May 10, 1890, ages ranging from two to five years. One three years old died of lock-jaw May 29th, or nineteen days later, the others all did well. Richard Howard, of Monkton, Md., had two ridglings cut on May 23, 1890, one aged nine years died of peritonitis four days later; the other, and also a three-year-old, cut same day, did well. J. T. Garrison, of Vineland, N. J., had black three-year-old cut October 16, 1890, which died of lock-jaw seven days later. Summary: Peritonitis 1, lock-jaw 3; total 4. Harrison Robbins, of Merchantville, N. J., had a bay three-year-old cut because of a strangulated hernia on April 15, 1891; he died April 18th, three days later of peritonitis. The operation was performed as a last resource, the animal having been sick for two days, and all other means employed to produce the reduc-

tion of the hernia before I was called to see the case; the owner was very desirous of retaining this horse entire. 1892, no deaths from any cause. 1893 I cut one for Henry Metzger, 3516 South Twenty-eighth Street, Philadelphia; it was a roan two years old, and on pasture in the Neck below Stone House Road, on a farm; cut him on May 9th; the location was very bad; no stable, only an old, broken-down shed; lands very wet, marshy and unhealthful; was called to see him on May 29th, and found him suffering from pneumonia; revisited him on the 31st, found him down and unable to rise; attempted to administer a stimulant when he stretched out and died. Post-mortem made at once and revealed double pneumonia. Mr. Frank Brown, of Philadelphia, had a sorrel horse cut at Diston's farm, Woodstown, N. J. The horse was eight years old, and I operated on him June 10, 1893; he died on June 19th, and a post-mortem made by Dr. L. M. Bignell and myself on same day proved that he died of peritonitis. Mr. Chas. H. Smith, of Haddonfield, N. J., had a brown thoroughbred ruptured on one side and ridgling on the other side; this horse was being prepared for this operation for two or three days previously. The animal was carefully cast and secured, the region of the right canal explored and entrance effected into the abdominal cavity. After considerable manipulation the gubernaculum testes was found (misplaced), gentle traction was made upon it and kept up for a long time, but the testicle did not respond; the animal made several violent struggles (which generally helps the operator) when this condition is found, in this instance it did no good, and I worked at it for half an hour, and could not pull the testicle to the opening which by this time had (owing to the struggles of the animal) grown so large that it admit of my entire hand going through and exploring the cavity. I failed to find the testicle however, and the withdrawal of my hand was followed by protrusion of the intestines into the opening and down into the scrotum. I then had another half hour's work replacing the intestines, sewing up the rupture (a very difficult thing to do by the way) and packing and plugging

up the wound with oakum, saturated with bichloride and creoline solution. I then reduced the hernia on the left side, which was present prior to casting the animal; removed that testicle by the covered operation, and let the animal upon his feet; for a time he seemed considerably distressed and I ordered stimulants administered during the balance of the day. Toward night he began to have violent pains and I was telephoned to that effect, I replied through the telephone directing them to use opiates. Through the night the horse rolled around considerably, but gradually grew more quiet; the following morning he appeared to be much better, so the groom said, but that evening he died. On the 22d I made a post-mortem examination; peritonitis had set it. A portion of the intestines had again passed into the inguinal canal on the left side, and was strangulated alongside of the clamps which I had attached to the covered cord. The stitches I had put into the right side were still holding, and the packing in place, but the parts surrounding were terribly inflamed. The ridgling testicle was found encysted in a mass of omentum, and all firmly adhered to a tumor about as large as a goose egg, which entire mass was adhered to the abdominal wall in the lower portion of the abdomen, and about on a line with the cartilages of the ribs; no amount of pulling on the cord from the internal inguinal ring could ever have loosened the testicle.

The walls of the abdomen had been injured probably from a kick externally, just at that point which most likely accounted for the condition within.

From the above list we show the causes of death to be from

Rupture of blood-vessel	1
Adenitis	2
Peritonitis	7
Tetanus	6
Blood-poison	2
Pneumonia	3
Total	21

Of those which died of peritonitis, at least three of them were ruptured prior to or at the time of the operation or both;

of the others, two were ridglings, and one was normal and all right at the time the operation was performed; from the above you will observe that the ratio of mortality during the last eleven years was less than during the first ten years, as the following will show:

From 1868 to 1877 inclusive, there were castrated 1144; number of deaths 19; ratio about 1¾ % from 1877 to 1883; record complete.

From 1883 to 1893 inclusive, I castrated 1416; number of deaths 21; ratio about 1 2-5 %. Perhaps the question may be asked, how do you know that the number mentioned above includes all deaths that have occurred?

When I operate at any place I take the name of the owner, age of animal and his description, and have the owner agree to write me or inform me by other means, if they prefer, just how long their animal was in *recovering*, or *if he died*. I may fail in some instances to get a reply if he recovers, but never if he dies, especially if he happens to be a favorite colt.

In my practice this is more likely to be the case than in many others, as almost all my operations have been done upon *special orders*, principally upon valuable stock upon which the owner did not care to assume any more risk than possible, therefore they prefer the standing operation.

I have prolonged this paper to a much greater length than I anticipated, I will therefore bring it to a close with *thanks* for your interest manifested and patience in listening to it, and if you have derived any benefit or obtained any useful information from it, I shall feel amply repaid.

REPORTS OF CASES.

SUPPURATIVE LYMPHANGITIS.

By W. C. Siegmund, D.V.S., House Surgeon, New York City.

A brown mare, the property of a dealer, after being turned out all winter, was brought to the city in the middle of March, to be groomed and fitted for sale.

About the middle of April the owner noticed one morning that the near hind leg was greatly swollen, having become so during the night. He thought it was only stocked, and set to work to treat it himself.

On the 16th of April we called to see the animal, and found her in the following condition:

The near hind leg greatly swollen, extending from the fetlock to the stifle and ischio-pubic symphisis. Corded here and there, ending very abruptly, throwing the leg and stifle in abduction and causing lameness. The leg was very hot and painful to the touch. The animal seemed in great distress, having a temperature of 105 1-5° F., pulse 76, respiration 24; coat harsh and dry, animal appearing hide bound. A diagnosis of lymphangitis was made, and animal ordered to the hospital.

The treatment consisted of a strong alcoholic stimulant and hot fomentation to the leg.

April 17th.—The animal's condition to-day is but slightly improved. Temperature, 104 2-5°; pulse, 72; respiration, 24. The leg was somewhat diminished in size, and a small ulcer, resembling a calk, was found on the anterior face of the coronet, from which a small stream of blood and pus escaped. The ulcer was cauterized with carbolic acid. There appeared during the day an œdematous swelling under the abdomen in the course of the left milk vein, extending from the left mammæ to the sternum. The same treatment was continued.

April 18th.—The animal's pulse and temperature raised as follows during the day:

8 A. M.—Pulse,	72;	temperature,	10 4-5°.
12 noon.— "	72;	"	102°
4 P. M.— "	60;	"	101°

No change has taken place in the swollen leg since yesterday. A small abscess, ruptured just above the inside of the hock, discharging a mixture of blood and pus.

The animal's appetite continues fair, taking 6 quarts of oats and 9 pounds of hay a day. Diuretics were added to the stimulant and the hot fomentations to the leg continued.

April 19th.—The leg remains in the same swollen, painful condition, accompanied by the formation and rupture of numerous small abscesses on the flat of the thigh, discharging the same creamy blood-tinged pus as the former. Old ulcers continued to discharge, their edges granulating angrily and having no tendency to heal. Suspecting the lymphangitis might be only symptomatic, the animal was inoculated with mallein to-day, and her temperature varies as follow:

8 A. M.	103° F.	4 P. M.	103 2-5° F.
10 "	100° "	6 "	100° "
12 noon.	102 1-5° "	8 "	105° "
2 P. M.	104 2-5° "	10 "	105° "

At 4 o'clock P. M. a painful swelling appeared at the seat of inoculation.

April 20th.—The swelling at the seat of inoculation has disappeared.

The animal's appetite continues fair, taking 6 quarts of oats and 9 pounds of hay.

Lungs were examined and found to be normal. The animal's temperature varies as follows during the day:

8 A. M.	103 1-5° F.	4 P. M.	101 2-5° F.
10 "	102 3-5° "	6 "	101° "
12 noon.	104 4.5° "	8 "	101 2-5° "
2 P. M.	100 3-4° "	10 "	104° "

There is no change in the swollen leg, abscesses continue to form and are lanced, old ulcers continuously discharge pus, literally covering the leg, matting the hair with pus of a foul odor. The leg is washed clean and fomented antiseptically twice daily.

Same general treatment continued.

April 21st.—There is a marked change in the animal's condition to-day, her temperature fluctuating between 101° F. and 104° F. during the day. The pulse is soft and full; the eye has a peculiar brilliant aspect and is drawn deeply into the orbital cavity. The coat is harsh, staring and hide bound. Animal appears in distress and pain. Abscesses continue to form and are lanced. A particularly large abscess was opened

about two inches above the tarsal arch, and about 20 ounces of pus escaped.

The alcoholic stimulant is given in increased doses three times daily. Fomentations continued.

April 22d.—The animal's appetite begins to fail her, she taking only two quarts of oats and five pounds of hay. The temperature fluctuates between 98° and 102° during the day. The continued suppurative drain begins to tell on the animal's system as she is gradually emaciating.

The leg does not decrease in size; more abscesses form and discharge.

April 23d.—After one week's treatment there are no signs of improvement in the animal's condition. The leg still swollen and painful, a mass of indolent ulcers, forming and discharging abscesses.

The animal's appetite is poor, the temperature fluctuating between 98° and 102 3-5° during the day.

The same treatment is continued.

April 24th–30th.—No change for the better, animal in still greater distressed pain. She has never lain down since she was admitted to the hospital. The temperature fluctuating between 98° and 102 4-5° daily. Up to date over forty abscesses have been opened, all having an ulcer which has no tendency to heal. The appetite is poor and the animal is reduced considerably in weight.

April 31st.—Animal was destroyed and the following post-mortem-examination made:

In dissecting the leg, the incision was started at the seat of the abscess, near the hock, following upwards in the course of the posterior tibial artery, between the bellies of the gastrocnemii muscles to the popliteal lymphatic glands, between the biceps femoris and semi-tendinosus muscles. Thence through the interstice, the branches of great adductor of the thigh, over the vastus internus, thence between the pectineus, sartorius and psoas iliacus muscles, and reaching the seat of the deep inguinal lymphatic glands.

In cutting the skin a straw-colored serosity was noticed to escape, but very little blood. The subcutaneous areolar tissue was infiltrated by material, varying one-half to one and a half inches in thickness, gritty under the knife, interrupted here and there by a small ulcer. After passing through this tissue a cavity was found measuring 2 x 2½ inches in diameter, following the course of the femoral arteries. This cavity contained pus and blood. The surrounding muscular tissue was anæmic; the intercellular tissue was of yellow color, prominent and modelling the muscular tissue. The deep inguinal glands and popliteal glands could not be found.

The subsacral lymphatic glands, reservoir of pecquer, spleen and thoracic duct were normal. The lymphatic vessels on the mesentary stood out prominently, appearing like the arteries do when injected with plaster.

THE TOXIC EFFECTS OF COCAINE AA. LOCAL ANASTHETIC.

By W. W. Yard, D.V.S., House Surgeon, New York City.

A large water spaniel bitch, ten years old, weighing about seventy-five pounds was brought to the hospital April 24th, for the removal of a large Sarcoma of the mammæ. Patient otherwise seemed to be in perfect health. All precautions being taken as to the age of the animal, a 4% solution of freshly prepared cocaine was hypodermically injected at six different points, patient receiving about 40 minims or 1 3-5 grains of the drug itself. After ten minutes had elapsed the operation was commenced and the tumor removed, accompanied with considerable hæmorrhage. Nothing abnormal being noticed but a slight dilatation of the pupil. The parts were antiseptically washed and dressed, and patient placed on her feet, but immediately fell to the floor, as if exhausted. When urged to move she staggered to her feet and moved round the room tossing head first to one side then the other and crossing one fore leg over the other. This continued for about ten minutes, and animal fell to the floor in tetanic twitching of muscles and champ-

ing of teeth; inhalations of ammonia were given but to no avail, and death followed.

Post-mortem revealed nothing but a very flabby condition of the heart with hypertrophy of its walls.

TUBERCULOSIS IN A GOAT.

By A. J. Sheldon, D.V.S., Springfield, Mass.

A pet goat which was kept in a model barn with food and care as good as the best horses receive, showed an indisposition in the early spring.

Instead of the traditional goats' appetite he grew very dainty, scarcely touching oats or bran, and when the grass appeared he nibbled a little but with no relish and at times would eat nothing, but continued to ruminate normally. The writers' attention was called to the animal when this state of affairs had existed about six to eight weeks.

He was somewhat anæmic with a rough, ill looking coat, in which some lice were found. His temperature was 98 2-5°, respiration normal, auscultation revealed moist râles in the right lung, but no dullness on percussion except a space about the size of a silver dollar.

There was a slight nasal discharge, opaque and tenacious: mucus membranes pale.

He was placed under observation for ten days and tonics were administered. At times he ate much better but was irregular about it and seemed inclined to stretch himself lazily in the sun. His temperature showed 98° in the mornings for three days, rising to 100 2-5°, or thereabouts, in the evening.

He was inoculated on the 19th of the month, at 7 A. M., with 1 cc. tuberculin solution (Bureau of Animal Industry), and at 5 P. M. showed 102 2-5°, 7 P. M. 101 4-5°, 9 P. M. 101 2-5°. The day following (20th), at 8 A. M. 100 2-5°, 10 A. M. 100 3-5°, 3 P. M. 101°, 7 P. M., 101 2-5°. 21st—8 A. M. 98 2-5°, 3 P. M. 99 4-5°, 7 P. M. 101 2-5°.

Post-mortem showed small particles of caseous degeneration here and there in right lung about the size of a pea. In left lung, at apex, a small amount of tubercle. On opening abdomen there was about six ounces of partly coagulated blood immediately behind the diaphragm, and protruding through the walls of the reticulum was a common pin, which had punctured the diaphragm in several places. Hence the capricious appetite, for as the stomach contracted, forcing the pin against the diaphragm, the pain caused him to stop eating and stand in the listless way we had noticed.

EXTRACTS FROM FRENCH JOURNALS.

VAN SWIETEN SOLUTION IN THE TREATMENT OF SUPPURATIVE DISEASES OF JOINTS.

The Revue Vétérinaire of February reports two very interesting cases from the clinics of the Veterinary School of Toulouse, showing the great advantages and rapid results that were obtained by the use of the Van Swieten solution in the treatment of suppurative diseases of joints. The first case, which occurred in the service of Prof. Mauri, was one of suppurative traumatic arthritis of the fetlock, which, from the momemt the horse received his injuries to the time he was shown to the clinic, some fifteen days, had gradually grown worse, and was in the most serious condition, with excessive lameness, escape of diseased synovia, lancinating pains, general reacting symptoms, etc. The treatment consisted in free incisions of the fistulous tracts, the application of a coat of blistering ointment all around the joint as a counter-irritant, and repeated injections of the Van Swieten solution (3 quarts per day), every two hours. After four days great amelioration was manifested; five days later the discharge had entirely subsided, the wound was almost all healed, the lameness rapidly disappearing, and, after a short while the animal returned to his owner.

The second case was that of an acute synovitis, following a wound of the sheath of the tendons of the anterior extensor of

the metacarpus. Subsequent to a fall forward, in which a mare had injured her left knee, the parts had become inflamed and swollen; there was a little wound in front of the knee, from which synovia escaped; lameness quite severe. The treatment consisted in free opening of the fistulous tract to allow the pus to escape, thorough antiseptic cleanliness of the parts with the Van Swieten solution, and as perfect immobility as possible of the regions enveloping the joint, with astringent poultices of chalk and vinegar. In five days the synovial escape had ceased, the swelling returned almost to its normal condition, lameness had disappeared, the cutaneous wound was rapidly cicatrizing. In two days she was discharged as cured.—*Rev. Vet.*

ARYTENOIDECTOMY.

By Prof. A. Labat.

The author publishes the record of three new cases of that operation performed at the Veterinary School at Toulouse in addition to that of six operations previously performed.

The result of the nine operations is résuméd as follows: One recovery that lasted at least nine months; three temporary recoveries, followed at various intervals with the return of the roaring as *severe* as before; *three* failures; *four* improvements and *one* death.

In conclusion, Prof. Labat says that much yet is to be heard before the operation can be considered as beneficial. Claims of success are too often premature, and the publication of cases that have been followed for a long time is urgently recommended. Evidently the operation may give valuable relief when some special favorable conditions are present.—*Rev. Vet.*

CONTAGIOUS DISEASES OF ANIMALS IN AUSTRALIA.

According to Dr. A. Loir, Director of the Pasteur Institute of Australia, glanders is yet unknown in this great island. Rabies, though dogs are in great number, does not exist. Anthrax fever and symptomatic anthrax exist, but are kept under fair control by vaccination. Contagious pleuro-pneumonia has

cost that colony millions of dollars. Preventive inoculation has been practiced there for years. Scabies in sheep was observed for the first time in 1862. Variola is so far unknown in Australia. Strict quarantine of various lengths of time are enforced for all animals before they are allowed the freedom of the island. The duration of this quarantine is 90 days for camels, 60 for bovines, 90 for sheep, 60 for other small ruminants, such as goats, deer, etc., and for dogs, six months.—*Rev. Vet.*

TERPINE AND TERPINOL IN THE BRONCHITIS OF HORSE AND DOG.

By Mr. Bissauge.

The author recommends the use of these products in the treatment of bronchitis of animals in the presence of the results obtained in human medicine, where they have been used as a diaphoretic and diuretic.

Mr. Bissauge reports a number of cases, twenty-one in horses and twenty-eight in dogs, where he has obtained thirty rapid and complete recoveries, seven were followed by partial success, and eight failed to obtain relief.

The mixture used for dogs was made up of terpine, 3 grammes, glycerine and diluted alcohol, of each 30 grammes, and of this a teaspoonful three times a day. For the horse, the terpine is mixed up with equal quantities of honey and flower.

Terpinol can be used in the same manner.—*Rec. de Med. Vét.*

DYSTOKIA BY PELVIC INJURY IN THE BITCH—LAPARO-HYSTEROTOMY—RECOVERY.

By Mr. E. Menveux.

The case is principally recorded to bring out the advantages of severe antiseptic measures in abdominal surgery.

A bull-dog slut, in a state of advanced pregnancy, was seriously injured by the wheels of a moving van having run over her body. After the accident she exhibited such symptoms

that a diagnosis was made of probable fracture of the pelvis and, with the hope of having her delivered of a valuable litter, she was made as comfortable as her condition allowed and watched. Four days after she was delivered of a dead pup in a state of putrefaction; but she had still another in her womb which could not be removed. It was then that the Cæsarean operation was decided upon, and it is described as follows by the author:

"After a careful washing of the uterus, and emptying the rectum with several injections, the bitch was laid on her back, the inferior wall of the abdomen washed, shaved and well disinfected. One cubic centimeter of a 1% solution of cocaine was injected on the median line, and an incision made; dividing the skin and the aponeurotic plane of the abdomen, on the linea alba, from the umbilicus to about one inch in front of the pubis. With a pointed bistoury the peritoneum was punctured and divided with a canulated probe used as a director. The edges of the wound were secured with the jaws of a strong pair of forceps, which reversed them outwards, and they were covered with a light layer of cotton, moist with a tepid mixture of Van Swieten solution. The abdominal cavity was explored, the right horn found, containing a large emphysematous, putrefying fœtus. This, with the placental remains were extracted through an incision made through the walls of the horn, avoiding the blood vessels and keeping the edges of the wound well apart with the forceps, and protecting them also with cotton and Van Swieten solution. The uterine cavity and that of the horn were disinfected, and the wound closed with the Jobert suture. The peritoneum closed with two loose sutures, the wound in the abdominal wall was closed with a deep suture involving the muscles, and a superficial one holding the skin. A dressing of iodoform collodion was spread over the wound and an antiseptic dressing applied all over."

The animal did well, and with scarcely any complication, and in eight days after the operation was returned to her owner. —*Rec. de Med. Vét.*

TREATMENT OF THE TAPEWORM IN THE DOG.

By Mr. Argoud.

For the author the following mixture constitutes an excellent preparation to relieve dogs from tapeworms:

The treatment is as follows: On the evening preceding it, a very light meal; the next morning a drench of 30 grammes of sulphate of soda in 100 grammes of water, to be followed four hours after with a mixture of the extract of malefern, 5 grammes; sulphuric ether, 10 grammes; simple syrup, 40 grammes. This to be given in two doses, half an hour apart if the patient is weak. Three or four hours after a second laxative of sulphate of soda is given.

The worm is expelled two or three hours after.—*Rec. de Med. Vét.*

OFFICIAL REGULATIONS IN THE USE OF MALLEINE.

By Mr. Laquerrière.

At one of the meetings of the Societé Centrale in Paris, Mr. Laquerrière read a letter from a sanitary veterinary inspector at Geneva, stating that the Suiss Department of Agriculture had appointed a commission to draw an official regulation relating to the use of malleine as a diagnostic agent for glanders.

The following were recommended and adopted by the Federal Government:

Every horse, donkey and mule belonging to a stable or to a herd of equine, among which one case of glanders should appear, shall be submitted to the test of malleine.

All suspected animals will be also treated in the same way.

All animals will be appraised previous to the injection. Every animal destroyed after the injection and found glanderous shall be paid as indemnity the quarter of its appraised value. If it proves to be free from glanders by the post-mortem, the owner shall receive the entire appraised value.

Mr. Laquerrière recommends the action of the Swiss government to the attention of the French authorities, and asks that similar legislation shall be issued as a means of reducing

the number of cases of glanders and possibly the extinction of the disease.—*Rec. de Med. Vét.*

[While the expectation of Mr. Laquerrière may be exaggerated, there is no doubt that much good may be derived from it, and American veterinarians would do well to appreciate the value of the Swiss regulations in, if not stamping out glanders, at least in protecting the stocks of their employers. Obligatory tests with malleine in large horse establishments imposes itself when one case has been discovered.—EDIT.]

EXTRACTS FROM GERMAN PAPERS.

BY RICHARD MIDDLETON, D.V.S., Philadelphia, Pa.

SARCOMA OR LEUCÆMIA.

Almost every year, on a certain farm in Saxony, one, at least, and some years several colts died of a stubborn bronchial catarrh. The post-mortem in each instance invariably exposed, beside a chronic catarrh, from six to thirty bodies which followed the bronchi in their ramifications; these varied in size from a cherry to a walnut, and when transversely cut presented a fatty surface with a yellowish-white hue.

In one case the lung was nearly obliterated by the aggressive usurpations of these tumors; in this particular foal swellings were also found in the mesentery of the small and large intestines. The enlargements in the lung were diagnosed as multiple sarcoma by the veterinary university. The agricultural department of the University of Leipzig decided the same to be the "usual swellings which accompany chlorosis."

The author examined the blood of two subjects which, a short time after the above decision, came under his care, and came to the conclusion that the affection was leucæmia, from the preponderance of the leucocytes present. He prescribed the following:

℞ Liq. potas. arsenici ʒ iiss.
Tinct. ferri ℥ ii.

M.

Sig. Half teaspoonful twice daily.

The result was most happy and astonishing; the catarrhal symptoms disappeared, patient became lively, and at the termination of a fortnight the more alarming effects had vanished. The medicine was dropped for a time and again, later, given. No swelling of the spleen was observed.

ESERIDINE FOR CATTLE.

The first article of Eher's, upon eseridine, was not sufficiently exhaustive to introduce this agent in veterinary practice. The difficulty which he at that time experienced regarding the solubility of the substance, has now been obliterated, and without the use, also, of diluted sulphuric acid solutions. He has found that two parts of eseridine and one of ac. tartaricum make a clear solution in one hundred parts of water.

The solution eseridine tartaricum is specially adapted for injections, since it induces no lesions at the point of application, and operates precisely as other solutions made by Ebers by the use of sulphuric acid.

The firm of Bölinger & Son has prepared, therefore, the E. tartaricum instead of the E. purum; the former is in doses of 4½ grains, and is doubtless obtainable through the house of Eimer & Amend, New York.

This medicine has been experimentally and practically used by Ebers, who recommends it as invaluable in all those diseases involving cessation of the pansen movements, *i. e.*, ruminations; he finds no other agent which he may use with more certainty of specific action. Felser has affirmed the same opinion in the annual report of Munich.

The application is to be made subcutaneous. After 15 or 20 minutes the contractions commence, and continue for two or three hours, occasioning incidentally the disappearance of any tympanites that may be present. About one-third of the patients show a diarrhœa one hour after administering; some cases exhibit slight involuntary muscular twitchings. In heavy oxen 4½ grains are given; cows receive 3 grains; in a nine-months'-old heifer 1¾ grains were sufficient.

In exceptional instances the good effects of restored ruminations were but temporary; in four cases the eseridine had opportunity to induce abortion in cattle, but nothing assuming such an occurrence was noted.

Eseridine resolves itself entirely into a symptomatic application, used principally to combat inhibition of the second stomach.

In flatulent conditions its action is materially aided by rectal injections of sod. chlor. and sod. bicart; much water, little hay and no green food. In three days, if the amount of water imbibed is still small, puncture of the pansen is advised, and by a rubber tube 20 to 25 quarts of tepid water, mixed with 3½ ounces æther, is to be introduced into the organ.—*Wtsch. f. pract. Th. Bv. Hii.*

PETROLEUM IN THERAPEUTICS.

The question of the medicinal value of coal oil, or rock oil as it is sometimes called, is in nowise a new one. Lucas, as early as 1808, records its use externally and internally.

In modern times it has been used internally for diarrhœa, in Russia, during the prevalence of the cholera epidemic in that country. Its action in favus is universally known. Larchner and Flanhof have lately used it in diphtheria with good results. According to Bardet and Adrian, petroleum is a conglomeration of substances which differ essentially in their peculiarities. The American variety contains the lesser order of carbohydrates, and is not so viscid or oleaginous as the Russian product, while that obtained from the Caucasian contains more combinations of the ethyl series. Regarding the therapeutic values of these, it may be said that they do not practically differ.

Three years ago Vigier published his experiments upon its uses in diphtheria; and then affirmed that the raw, or unrefined, was preferable as a solvent for the pseudo-membrane to the commercial variety, or common coal oil, of the stores.

In veterinary science petroleum has failed to supply any need; although applied as an antipariseticum, its action is un-

worthy of remark. There is, however, one very noteworthy characteristic of this abundant and cheap material, which the observant practitioner cannot afford to overlook, and that is its power of passing through animal membranes. It furnishes to us an admirable remedy, when applied crude, for the prevention of brittleness of the wall and sole of the foot. And in such cases may be applied with more *real* benefit than the majority of extant hoof remedies.—*Allg. med. Centralzt. 62.*

SCIRRHUS CORD IN OXEN.—Roeder has frequently seen this affection follow a carelessly performed castration. Free incision of the scrotum permitted the escape of accumulated pus, and conscientious injections of disinfecting agents produced a cure in some cases. In two instances the ends were laid bare and light clamps were adjusted thereon. The best results are obtained by exposing the stumps, and amputating as far up as possible, ligating the vessels and disinfecting.

CUTANEOUS EMPHYSEMA.—In a heifer a wound was made upon the vulva during the operation incident to removal of an anasarcal calf. By the third day the animal was deformed along the inferior and lateral portion of the body, by a subcutaneous emphysema extending from the vagina to the cervical region. The general constitution was not prejudiced thereby; after the lapse of nine days, the same commenced to recede, and after four weeks only minute crepitations could be detected at the breast.

OSTEOPOROSIS.—Several foals belonging to a miller, and receiving rations of bran, became affected with an exostosis of the feet and joints, accompanied by swelling of the maxillary bones and narrowing of the nasal caliber. A few of the more benign cases recovered upon removal to different surroundings. As an experiment, two foals were fed upon bran and hay, and two upon oats and hay; after a time the same symptoms appeared in the former while the latter remained immune.—*Archiv. f. wiss. u. pract. Th.*

FLUOR ALBUS.—A cow had become greatly reduced in flesh by the continuous and uninterrupted discharges incident to lencorrhea. Roeder introduced a catheter and thoroughly flooded the vaginal cavity with thymus serpyllum. After three days he again introduced a 5% solution of alum, which he repeated one week later, allowing it to remain in the cavity. The animal exhibited symptoms of abdominal pain about ten hours afterward, and by straining caused the expulsion of a small quantity of the solution which had not been absorbed. Recovery followed rapidly and completely.

REVIEW OF BIOLOGY.

UPON THE MORPHOLOGICAL VALUE OF HORNS IN HORSES.

By Mr. L. BLANC.

Horns in horses are constituted by a skeleton base covered by a normal, or horn-like skin. These appendages are situated on the frontal bone, inside the base of the orbital process, about the frontal foramen, at a point corresponding very nearly to the place of the horns of ruminants of the ovine type.

The skeleton axis is formed by a cartilaginous nucleus which is ossified in animals advanced in age; crescent in shape, with the concavity inward, projecting, or almost on a level, with the frontal, in which it is imbedded as a tooth in its alveola.

Most ordinarily the ligament is normal, round, and on a level with the horn. Sometimes the epidermis undergoes the horny transformation, and then there is a conical envelope, two or three centimeters long, fibrous in appearance, and having the structure of the young horn of the hoof of horses.

These horns are not, by their axis, part of the frontal; they belong to the primordial skeleton of the cranium, and are formed by the extremity of the apophysis of Ingrassias.

On any colt, the wing of the anterior sphenoid is continued outwards and upwards by a cartilaginous lamella, fan-shaped. This lamella penetrates into the depression of the orbital portion of the frontal, then, a little more upwards, goes into a deep

groove, hollowed between the two plates of that bone. The apophysis of Ingrassias, yet cartilaginous, penetrates also in the frontal and reach in contact to the external lamella, which it closes with the summit of its convexity. Sometimes it perforates the frontal, appears at the superficy, and the horse has a horn.

This cartilaginous lamella is not contained entirely in the thickness of the orbital portion of the frontal. Its anterior half extends in the frontal sinus, where it forms a band entirely surrounded with bony tissue; this band is found in all subjects, even the oldest.

When the animal gets old the extremity of the apophysis of Ingrassias ossifies little by little from the center to the circumference. In horses that have horns, aged three or four years old, one finds in the frontal a bony conical wedge, surmounted with a cartilaginous nucleus and enlarging the wing of the anterior sphenoid. At this moment these pieces are perfectly distinct from the frontal, though intimately united to it later on.

The axis of the body of the horse belongs then to the primordial cranium; it is formed by the summit of the wings of the anterior sphenoid, which are surrounded by the frontal at the time of the formation of that bone.

The similitude of position which exists between the horns of horses and those of ovine ruminants allows us to believe that there is similarity of origin between these appendages. In sheep, goats and like ruminants the part of the frontal where horns develop is exactly on a level with the summit of the wing of the anterior sphenoid. In bovines, the point of insertion of horns is higher up in relation to the sphenoid; but the elongation of the frontal is a character which is not found in all the periods of fœtal life, and towards the fourth month of gestation the keratogenous point is exactly in the same situation, in relation to the sphenoid, as it is in ovine ruminants and in horses.

The question might be asked, if the horns of ruminants, which to this day have been considered as depending from the frontal, have not for a starting point, as in horses, the wings of the anterior sphenoid.—*Soc. de Biology.*

THE EXISTENCE OF A STRYCHNIZING SUBSTANCE IN THE MUSCLES OF TETANIC ANIMALS.

By N. H. J. Courmont and N. Dayon.

The muscle made tetanic by the subcutaneous injection, intra-muscular or intra-venous, of soluble products of the bacillus of Nicolaier (after a constant period of incubation) contains a *strychnizing* substance—that is, one which can give rise to *contractions without incubation.* The chemical isolation of this substance is most difficult, but it is possible to obtain it with a simple *aqueous extract.* This is prepared with the muscular mass of the region in contraction. The muscles are freed from all grease and hatched very fine; to the mass water is added, and is exposed to ebullition for forty-five minutes to an hour, until it is dried up. The remains are watered again, pressed and filtrated. The liquid thus obtained is then injected into the frog, better under the skin of a hind leg, so as to have the first contractions more apparent.

According to the dose used, the frog will present either a simple hyperexcitability or a true *strychnism*, or a short period of excitability, soon followed by paralytic coma and death. From five to seven grams of tetanic muscle have given, to the authors, most marked effects. In that condition one can for several hours, if the animal lives, observe symptoms similar to the strychnia poisoning.

The extracts can contain any trace of the soluble products of the bacillus of Nicolaier, as these are made inactive by a heating at 65° F.

The extract similarly obtained from the *muscles of a normal dog* is toxic to the frog except at high doses (some 20, 30 grams of muscles or even more), and never produces phenomena of excitation.—*Ibid.*

ACTION OF TUBERCULINE AND OF MALLEINE UPON THE SUDORAL SECRETION.

By M. M. Cadiot and Roger.

Horses and cats which perspire easily were injected with tuberculine and malleine. From the effects produced, the following conclusions are derived:

Tuberculine is without apparent action upon the sudoriferous apparatus.

Malleine, on the contrary, produces in these animals a diaphoresis varying, more or less, according to the dose injected, and so much more abundant that the injection is larger.

The sudation cannot be attributed to the hyperthemia; it is due to an action produced by the microbic product upon the nervous centres; proof of it is, that a section of the sciatic nerve in the cat, done previous to the injection, will prevent the manifestation of sudation of the unnerved extremity.—*Ibid.*

PNEUMO-BACILLINE AS A REACTIVE AGENT IN GLANDERS.

By M. S. Aroling.

It has been shown that the products of cultures of some microbes, besides the bacilli of Koch, would give strong reaction in tuberculous subjects. The author has thought what would be the effect of the products of cultures of the *pneumo-bacillus liquefaciens bovis*, or the *pneumo-bacilline*, in the diagnosis of glanders, and whether its effects would not be similar to those of malleine, taking into consideration the pyogenic effects it has in healthy cattle as well as on those affected with chronic pleuro-pneumonia.

Eight horses affected or suspicious of glanders, received comparative inoculations of malleine and of pneumo-bacilline. The thermical reactions were much the same, much higher in really glanderous patients, less in suspicious. In one case only, which proved glanderous at post-mortem, was there any notable difference. Pneumo-bacilline may, therefore, be used in place of malleine.—*Rev. de Biol.*

SOME NEW EXAMPLES OF TUBERCULOUS VACCINATION IN DOGS.

By M. M. J. Hericourt and Ch. Richet.

Confirming previous experiments already published, the authors reported some new cases which bring them to the conclusion that: First, vaccination can be obtained, in the dog at

least, against human tuberculosis, either with the use of aviary tuberculosis or with small doses of the human products of the disease. Second, that the defectuous part of the experiments, is the serious nature of these processes of vaccination themselves, which generally are accompanied by a mortality of about 50%.

In the point of view of immediate medical application these results are of no value, but they prove that tuberculosis is an affection which admits of vaccination, a fact which justifies great hopes which merely rest on the discovery of an inoffensive *modus operandi.—Ibid.*

COLLEGE COMMENCEMENT.

McGILL UNIVERSITY—DEPARTMENT OF COMPARATIVE MEDICINE AND VETERINARY SCIENCE.

The commencement exercises were held on Friday, March 30, 1894, and the following passed their examinations in the order of merit given here:

C. French, J. A. Buchan, B. Anderson, A. H. Hall, J. D. McGillivray, A. Cameron, G. P. Baker, A. E. Moore, C. J. Carey, J. V. Solandt, D. McAlpine, R. H. Grattan, J. R. Shaw, J. H. McLeod, R. H. Cleveland, I. L. Salley, J. T. Walsh, C. J. Mulvey, R. Thomas and T. F. Scott. Dr. C. French carried the prizes on Veterinary Medicine and Surgery, on Cattle Pathology and best general examination.

SOCIETY MEETINGS.

INDIANA ASSOCIATION OF VETERINARY GRADUATES.

The semi-annual meeting will be held at Indianapolis on the 9th and 10th of July, at the agricultural rooms of Capital Building.

A very interesting meeting is anticipated, as several papers of importance are to be read, and the Governor of the State has promised to deliver an address at the evening session of the 9th.

SUNDRIES

ACTINOMYCOSIS.—The transmissibility of this disease to animals by direct inoculation has been studied by Professor M. Wolff and Dr. J. Israel, who have succeeded in making pure cultures from a case of actinomycosis hominis by sowing the granules on agar kept at 37° and devoid of air. The microbe is considered to be an anærobe, yet a small quantity of oxygen does not prevent its growth. It grows very well in alkaline bouillon. The microscopical appearance of this microbe is said to be very variable—short and long rods, simple, straight and branching or wavy filaments, cocci, and felt like masses are seen. The cocci are found free, but more frequently within the rods or filaments. The authors refrain from expressing a definite opinion as to their exact nature, but do not regard them as spores. They stain well by Gram's method. In none of the cultivations were club shaped elements met, but by injecting these cultivations into animals, tumors containing club shaped bodies were produced. Twenty-two animals were inoculated with the agar cultivations, and in all except one (a sheep) actinomycotic tumors were developed.—*Medical Record.*

TUBERCULOSIS IN THE DOG AND CAT.—Eber has made autopsies upon 400 dogs and 100 cats to discover whether tuberculosis was present, and found it in eleven of the former (2.75 per cent.) and one of the latter. The anatomical diagnosis was in every case established by microscopical examination for the tubercle bacilli. In nine of the eleven dogs the lung was the organ chiefly affected. The disease manifested itself in eight cases in the form of chronic indurating broncho-pneumonia with central softening of the newly formed tissue. There were also complications in the form of chronic bronchitis with bronchiectatic cavities as well as pleurisy, pericarditis, and hydropic collections. The bronchial and mediastinal lymph-glands showed only in two cases distinct tubercle formation; in the remaining cases they were

hyperplastic only, or showed no changes. No changes were demonstrable in the mucous membrane of the intestines. The product of tuberculosis in dogs showed a peculiar sarcoma-like condition, in which were numerous soft masses, containing pure cultures of tubercle bacilli. In the cat chronic tuberculosis of the lungs and related lymph-glands was observed. Eber shows by this that the distribution of tuberculosis in the dog and cat is not everywhere as great as in Copenhagen and in Denmark generally.—*Medical Gazette.*

CORRESPONDENCE.

ONTARIO VETERINARY COLLEGE.

To the Editor:—

SIR:—In your report of the second day's session of the Pennsylvania Veterinary Medical Association, dated March 7, 1894, Dr. J. A. Waugh calls attention by letter to an advertisement which, he says, was published in the *Spirit of the Times*, dated Dec. 3, 1893, of the Ontario Veterinary College advertising for students for a term of three months.

The letter was referred to the Board of Trustees who, report

"That we deprecate the action of the Ontario Veterinary College, and recommend that this association centure the faculty of the said college for abbreviating the course of veterinary education."

"The recommendations of the board were received."

I enclose the advertisement of the Ontario Veternary College in the *Spirit of the Times*—there has been no change in it

ONTARIO VETERINARY COLLEGE,
TORONTO, CAN.,
In connection with Agricultural and Art Association.
Established 1862.
Session of 1893-94.
All experienced teachers.
PROF. SMITH, V.S., Edin., Toronto.

An editorial notice which, by the way, was not put in by any one in connection with the college, appeared in the *Spirit of the Times* Dec. 2, 1883. Although the faculty are not in any way responsible for this editorial, yet I think that no fair-minded man can possibly place upon it the construction which seems to have been assumed.

The length of time of the Ontario Veterinary College is two full sessions, and students are required to practice the greater part of the summer under a qualified practitioner. At the expiration of his last session, a student is entitled to go up for his final examination.

The censuring of the faculty of the Ontario Veterinary College was apparently passed simply on the unsupported evidence of a letter, the writer of which has evidently a most elastic imagination. And is it creditable for a body of scientific men to accept conclusions without verifying the data upon which they are based?

C. M. SWEETAPPLE, V.S.,
Professor of Obstetrics and Cattle Pathology
Ontario Veterinary College.

UNITED STATES VETERINARY MEDICAL ASSOCIATION.

To the AMERICAN VETERINARY REVIEW:—

Owing to the fact that it has not been feasible to convene the congress during the past winter session of the various veterinary schools, after thorough consideration the Committee on Congress of Colleges have decided to call a meeting of the same at Buffalo, N. Y., on Saturday, July 14th, and notice is hereby given to all veterinary colleges, and it is hoped that by fixing this time that all will be prepared to send delegates to consider the subject of Veterinary Education in this country.

By order of the Chairman,

W. HORACE HOSKINS, *President.*